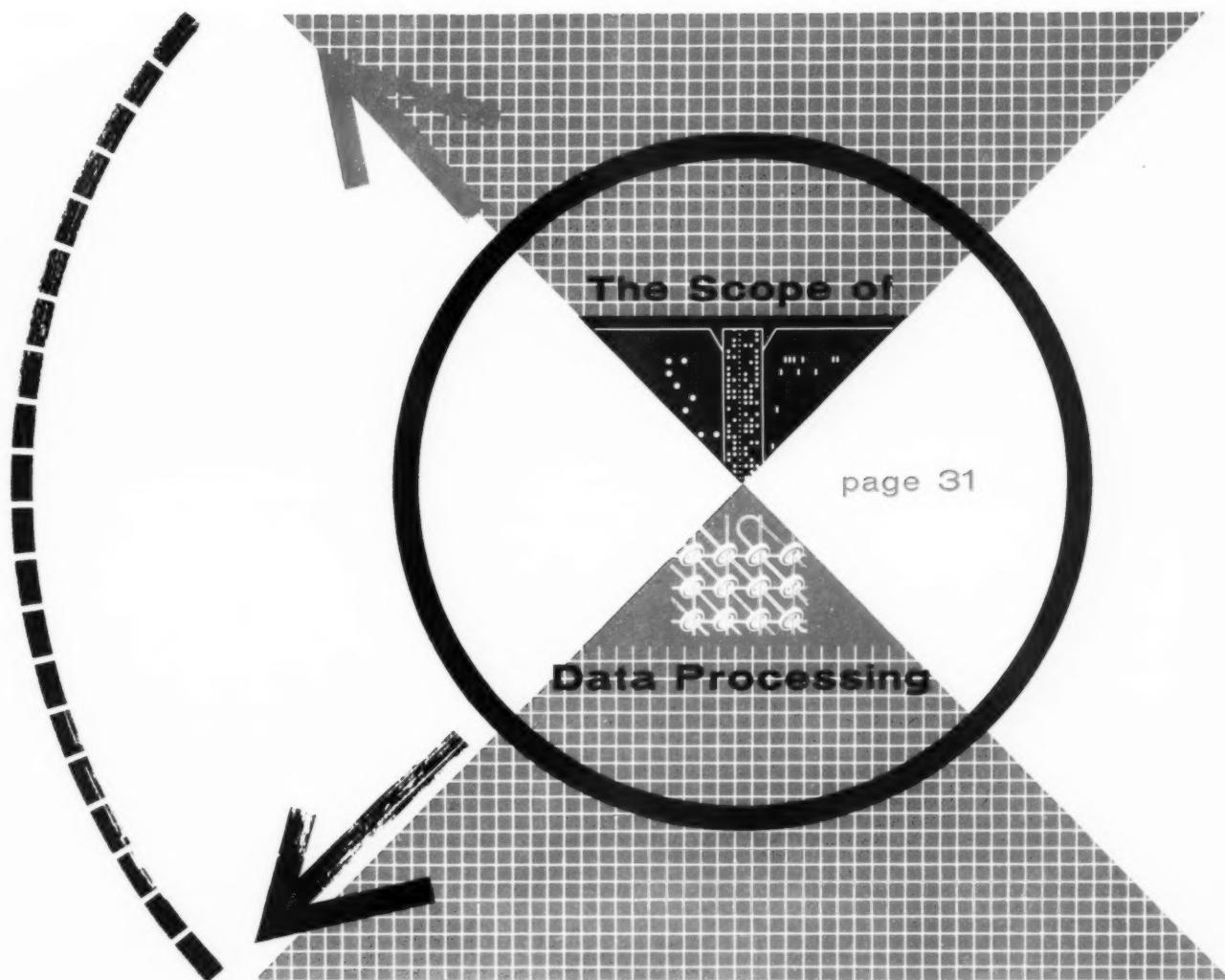


DATA PROCESSING

THE MAGAZINE OF AUTOMATIC OFFICE METHODS AND MANAGEMENT

APRIL/MAY 1960
SPECIAL COMBINATION ISSUE



- ▶ Women's Role in Data Processing —page 19
- ▶ Computer Programmers Are Where You Find Them —page 15
- ▶ Electronic Data Processing and Subscription Fulfillment —page 25

Unitray System speeds card handling at Montgomery Ward



"**UNITRAY** has enabled
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simplify card handling thus providing
a substantial contribution to the efficiency
and economy of
our operation."

E. L. MILLER

Manager of Data Processing

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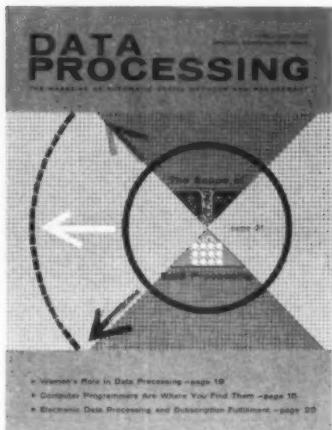
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DATA PROCESSING

Volume Two • Number Four



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Published monthly by
GILLE ASSOCIATES, INC.
956 Maccabees Building
Detroit 2, Michigan
TEmple 3-3454

EDITORIAL OFFICES
270 Madison Avenue
New York 16, New York
LEXington 2-2990

ADVERTISING OFFICES

MAIN OFFICE
956 Maccabees Bldg.
Detroit 2, Mich.
TEmple 3-3454

270 Madison Ave.
New York 16, N. Y.
LEXington 2-2990

1417 Georgia St. 420 Market St.
Los Angeles 15, Calif. San Francisco 11, Calif.
Richmond 7-6561 DOuglas 2-3899

Subscription rate \$7.50 per year, United States and possessions and Canada; other countries \$8.50 per year. Single copy 75¢ when available.

Send subscription correspondence and change of address to Gille Associates, Inc., 956 Maccabees Building, Detroit 2, Mich. Subscribers should notify publisher promptly of any change of address, giving old and new addresses, including city postal delivery zone. If possible, enclose address label from recent issue of magazine. Allow six weeks for change to become effective.

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Also publishers of The Punched Card DATA PROCESSING Annual (Applications Volumes and Reference Guide) and Data Processing Handbooks.

OBSERVATIONS . . . from the publisher . . .

THIS COMBINATION ISSUE makes it possible to bring you a special report entitled, "The Scope of Data Processing." Contained in this report are quite a number of interesting views on important developments in this field.

While each of the topics covered in this report could be the subject for a lengthy and detailed treatise in itself we believe that you will find a greater value in the condensed approach that has been used. You may find this feature of sufficient interest to route to other persons who might stand to gain from a general review of this type.

One of our greatest pleasures is having the opportunity to meet readers personally and to chat with them about their activities and particularly their problems. This opportunity occurred recently as we were exhibiting our publications at the Northeastern N.M.A.A. Show in New York. We were indeed pleased that so many of you took time to visit our display and to talk to our editors and me. This was our first opportunity to show, at least in "dummy-form," the new series of handbooks which are nearing completion. We feel that these handbooks are a major step in bringing Data Processing information to its most usable form. Now for the first time it is possible to find, in your own library, information on specific subjects and in sufficient depth to be of real value. Several thousand orders for these books have already been received and this is ample testimony of their need. It might interest, but certainly won't surprise you, that the subjects in greatest demand are: Payroll, Inventory Control and Panel Wiring.

We hope to be able to start shipping the first of these handbooks within the next few weeks and only regret that we were unable to reach the original March delivery date. We greatly appreciate the patience you have shown and we trust that you realize that many production problems have to be overcome when introducing a new publication. It has always been so in the publication field despite every effort to overcome it.

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AUTHORS

GERALDINE M. OXLEY ("Women's Role in Data Processing") joined the New York Life Insurance Company in July of 1951 after her graduation from the College of Mount St. Vincent, where she received a Bachelor's degree in Mathematics. Following a three year training period she was assigned to work as a programmer of data processing equipment. She received her present appointment of Supervisor of Electronic Research and Planning in May of 1959 after several years of experience as a systems analyst, planning applications for a large scale electronic computer.

JOSEPH M. ARNSTEIN ("Electronic Data Processing and Subscription Fulfillment") was first employed as a subscription clerk in the Fulfillment Section of Esquire magazine and was soon introduced to the mechanical intricacies of the Speedumat machine. In the

twenty-four years since, he has successively, and successfully, tackled increasingly complex problems as Esquire has grown. This has won him a long series of promotions, and today he is Vice President of Circulation of Esquire, Inc. In this capacity, he heads all circulation activities for the company's publications, Esquire, Coronet and Gentlemen's Quarterly, and, in addition, participates in the management of the company's affiliated project, the Esquire Club.

Joe Arnstein is widely recognized throughout the magazine industry as one of its foremost experts on circulation. Among the many industry-wide posts he has held are Vice Chairman of the Board of Directors of Central Registry, Magazine Publisher's Association; and Director, XYZ Club, an Association of Field Selling Organizations. ■

Bendix G-20

the new data processing system with the ORGANIZATION CHART concept

"Organization Chart" design in the Bendix G-20 means far faster, more efficient processing of scientific and business problems. The reason is clear:

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The G-20 Central Processor, or computer, has a staff of well-taught subordinates that can take instructions from the "boss" and go to work on their own, directing the workers that perform such tasks as reading punched paper tape and cards, looking up data on magnetic tape, and printing results. The "boss" can direct numerous subordinates, and without human intervention, schedule the work for each, making sure the most important work is done first. While the subordinates handle the details, the Central Processor is free to do the all-important computing.

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BENDIX AVIATION CORP., COMPUTER DIVISION Dept. 525 Los Angeles 45, California

SPECIFICATIONS:

MEMORY: Core, to 32,768 words in 4096 word modules.

EXECUTE +: 7 μ s. avg., fixed point, one-word precision. 13 μ s. avg., floating point, one-word precision.

EXECUTE X: 49 μ s. avg., fixed point, one-word precision. 49 μ s. avg., floating point, one-word precision.

ARITHMETIC: Built-in floating pt., 12 dec. digit precision.

CIRCUITRY: Solid-state; parallel; 2.5 kva.

PROGRAMMING: Symbolic assembler or algebraic compiler.

INPUT/OUTPUT: 165,000 char./second max., asynchronous.

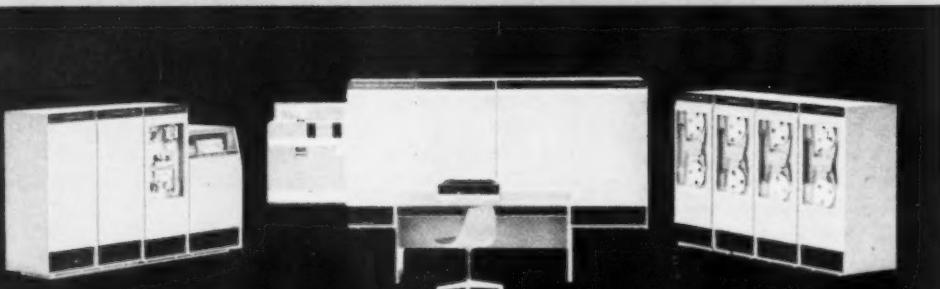
MAGNETIC TAPE: 120,000 decimal digit/second read-write.

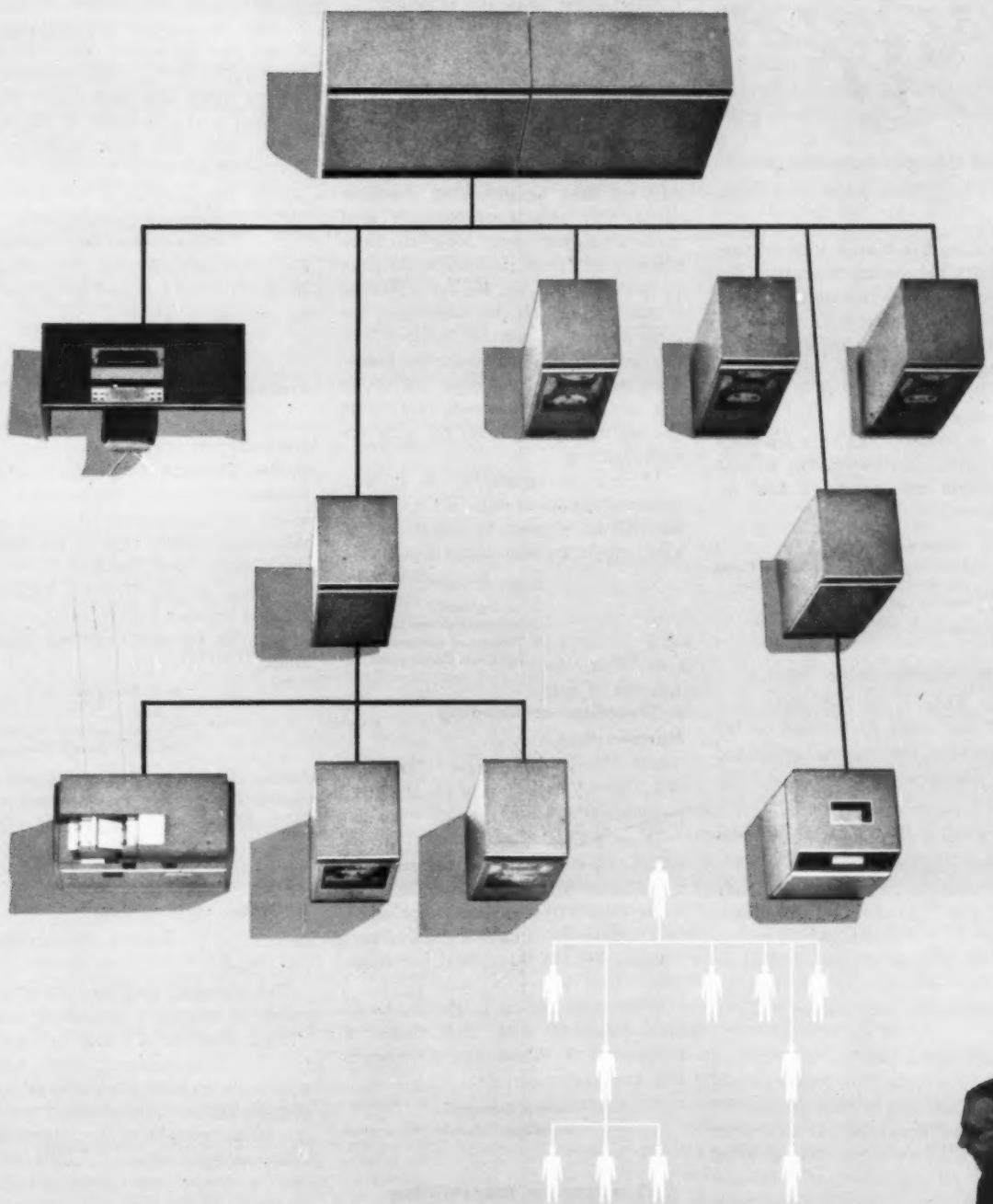
LINE PRINTERS: 600 lines per minute.

PUNCHED TAPE: 500 or more character/second readers. 100 or more character/second punches.

PUNCHED CARDS: Standard high-speed 80 column units.

CONTROL BUFFERS: 1024 character memory for data and commands. Controls transmission on-line or off-line.





Comments from Readers



Editorial Competition Insignia

El Toro (Santa Ana), California

Dear Sir:

In reading the March 1960 edition of the Data Processing magazine, the personnel of this Installation were so impressed with the Editorial Competition insignia on the cover that they suggested that the insignia be used as part of an insignia for this Installation.

It is requested that this Installation be given authorization to use the insignia as shown on the enclosed sketch . . .

Clarence L. Davis

First Lieutenant U. S. Marine Corps
Assistant Data Processing Officer
Marine Corps Air Station

Ed. Permission granted.

Random Interrogation Advice

Editor's Note: The following is a copy of the reply forwarded to the reader whose inquiry we published in the January DATA PROCESSING.

San Diego, California

Dear Mr. Hughes:

This letter is in response to your note in the "Comments from Readers" in DATA PROCESSING magazine in which you expressed interest in finding information on storing 40,000 stockroom locations of 7 digits each.

Stromberg-Carlson — San Diego Division has both input and output devices which might just fill the bill in your case. Recently, our engineers came up with an input device called "BETA" (Burst Electronic Transmission Apparatus) which is a commercial offshoot of a Marine Corps battlefield surveillance device which we are studying for installation at Convair Astronautics for Quality Control, Material Control, Tool Control, Information Retrieval, and Change Control. Enclosed are copies of some very rough sketches of this system.

The BETA device is portable and

a little larger than the standard office telephone. It has 21 switches which transmit a "Burst" type audio signal over phone line without any actual connection to the phone. This audio signal may either be binary or BCD and, therefore, can be fed directly into any digital computer without first keypunching machine cards. Our engineers recently sent such a signal over long distance phone from Fort Huachuca, Arizona to San Diego. Like BETA's Marine Corps father, if the customer has such a need, it can be plugged into any voice radio set and digital transmissions can be sent over the air at the same time someone is talking on the set without interfering with the conversation.

If you are interested in further information about our BETA system, we will be pleased to assist you in applying it to your operation.

Ernest O. Agee

Sales Engineer
Stromberg-Carlson Company
A Division of General
Dynamics Corporation

A Question re Reading Handwriting

500 Bittner Street
St. Louis 15, Missouri

Dear Sir:

In reviewing the January 1960 issue, I noted on page 27 reference to a machine for reading handwriting as developed by Bell Laboratories. In this connection, I have a requirement where I believe this might be adaptable.

If there is anyone in the St. Louis area familiar with this piece of equipment, I would like to discuss this further.

John J. Gassner

American Lithofold Corporation

A Question re Transmitting Information

915 Olive Street
St. Louis 1, Missouri

Dear Sir:

Recently we have merged with another agency on the east coast and are in the process of availing our Tabulating Department for their use.

I would like to know if there are such articles, books or a group of

companies I could contact in regards to how to handle this situation — where you have the main office in the middle west, with information coming from the east coast, to be punched and processed in the main office, and then sent back to the east coast office.

Eugene J. Meyer

Tabulating Supervisor
Gardner Advertising Company, Inc.

Ed. Can anyone help Mr. Meyer?
Write him directly and we're certain he will appreciate it.

Training Guide

Portsmouth, Ohio

Dear Sir:

The Training Department of the Goodyear Atomic Corporation has asked me to obtain permission from your magazine to reprint the following article: "An Alphabet of Morale Building," Samuel Towsen. This article will be used within the Company as a guide for our Training Department.

W. S. Stringham

Supervisor
Technical Review Department
Goodyear Atomic Corporation

Permission given. Many requests for reprints of this article continue to be received. Reprints may be ordered from this office.

A Guide to Reading

Boston, Massachusetts

Dear Sir:

The Harvard Business School publishes a monthly periodical called "The Executive: A Guide to Reading for Top Management." This magazine contains brief abstracts of books and periodical articles which we feel should be brought to the attention of business executives. . . . We would like to obtain permission to include abstracts of your publications in our service. . . .

Sylvia P. Field
Associate Editor

Permission given.

■ ■ ■

Data Processing

QUIZ

QUESTIONS

1. After cards are punched and verified, they are usually listed on an accounting machine. What purpose does this listing or "daily register" serve?
 2. Describe some uses of the collator.
 3. What are a decollator and a burster?
 4. Define and explain "MICR".
 5. Identify each of the following data processing abbreviations: ACM, NMAA, SPA, USE & FORTRAN.
 6. Describe the method used to place an expanding alphabetic file in order without relying on strict alphabetic interpolation?
 7. When and where were punched cards first used in the U. S.?
 8. There are several methods of printing used in data processing. Name three.
 9. ENIAC was one of the first computers, as computers are known today. Name one of its two inventors.
 10. As punched card data processing makes a greater and greater impact on business and management, do you think that at some time in the future punched card data processing managers will become presidents of their companies? (Readership opinion requested. Write to editorial offices at 270 Madison Ave., New York 16, N. Y.)

ANSWERS

1. A "daily register"; listing services as a further method of service checkbacks.
 2. A collector may be sent to square one check a file (deck) of cards; merge two files (decks) of cards into one; select certain types of cards and carboard copies into other decks.
 3. A decollector separates original card and carboard copies into separator stacks; eliminates certain information interleafings. A distributor separates continuous forms of preferformations into single units, such as checks, invoices, etc.
 4. A special ink containing magnetic particles and is now used on the American Society Association and is now used on original source data. It was developed initially by the Special Ink Corporation, Systems and Procedures Readling of Demand Deposit Accounts.
 5. Association of Computer Manufacturers, National Manufacturers Association, Univac Scientific Exchange, Formulte Trans-lation.
 6. An expanding alphabetic file may be put in order by creating a numeric gap-code. Assign a range of num bers to the entire file, e.g., 00000 to 99999 for the oblongs, thus all 0 to 99999 fit into 00000 to 09999. As additions occur they are imo 04950 to 08990, etc. As additions occur they are freed into this frame.
 7. The Federal Government used the first application of punched cards (the medium using round holes—see the Census developed by Hollerith) in the 1890 Census. As a result the Census was completely processed in two years, for the entire country for 1890, report if punched cards had NOT been used.
 8. Printing methods used in data processing include Type Bar; Type Wheel; Matrix Wire; Stick.
 9. Echelon and Machlely were inventors of ENIAC.
 10. What's your opinion?

THE FIRST AMERICAN MANAGEMENT ASSOCIATION FORUM on simulation and business games will meet May 16 - 18 at the AMA Academy at Saranac Lake. The forum will highlight the increasing use of simulation for training, operations research, and the study of human behavior.

The first day of the meeting will be devoted to presentations by representatives of industry, research organizations, and universities covering current developments and applications of simulation. Small-group discussion sessions by the registrants will take up the entire second day. On the final morning a panel group of eight men, all with wide experience in simulation, will answer questions arising from the project groups and also will discuss the status of simulation in business and research.

SIMULATION FORUM

The Program

Dr. Jack D. Steele, director, executive development program, School of Business, University of Kansas, Lawrence, Kans., will open the forum with a discussion of simulation as it stands today. The potential contribution of simulation will be forecast by Dr. M. O. Kappler, president, System Development Corp., Santa Monica, Calif.

Three speakers will cover applications of simulation in specific fields. Dr. Seymour Levy, manager—manpower development and personnel research, The Pillsbury Co., Minneapolis, Minn., will discuss using simulation for personnel development. Simulation as a tool of analysis will be explored by Dr. Robert Maffei, associate professor of industrial management, School of Industrial Management, Massachusetts Institute of Technology, Cambridge, Mass. Simulation applications in the field of human behavior will be discussed by Dr. Robert Chapman, director of simulation laboratories, Ramo-Wooldridge Corp., Denver, Colo.

A description of the mechanics of simulation, including model building, design and scope of models, and computer vs. non-computer applications and programming will be offered by Joel M. Kibbee, director of customer education, Remington Rand, UNIVAC, a division of Sperry Rand Corp., New York, N. Y. Mr. Kibbee also will serve as general chairman of the forum.

Topics to be covered at the small-group panel sessions include the following: simulation in the university, simulation in industrial training, socio-psychological uses of games, the mechanics of games, the validity of simulation for training, simulation as a tool of analysis, generalized management games and functional and specialized games. Chairman of the final panel session will be Dr. John F. Lubin, associate professor of industry, Wharton Graduate School, University of Pennsylvania, Philadelphia, Pa. ■

NEW VERTICAL PROCESSING TAB TRAY BOOSTS EFFICIENCY in EVERY CARD HANDLING OPERATION

*Exclusive Design of Diebold VERTICAL
PROCESSING TRAY Expedites Tab Card Handling, Sorting,
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VERSATILITY

The Diebold Vertical Processing card tray works for you all the time! It serves as a storage unit, as a pocket for the sorter rack, as a card carrier and machine feeder. Truly a full-time "working" tray, one that can help you get maximum efficiency from your machines. Check these exclusive features.

AUTOMATIC ANGLE

The exclusive "Automatic Angle" of the Diebold Vertical Processing tray provides efficient card handling when tray stands on either end. Cards are kept in proper position for machine feeding — are angled above horizontal plane to prevent spillage from machine vibration.

EXCLUSIVE ADJUSTOMATIC FRONT PLATE

Thanks to dual-purpose design, the Diebold "Adjustomatic" front plate can be instantly positioned to provide working card angle. A touch of the finger returns plate to storage position. A full card label is provided . . . one that is visible when tray stands on either end . . . provides positive tray identification during processing!

MULTIPLE COMPRESSION POSITIONS

The Diebold "Adjustomatic" compressor provides five different degrees of compression. Downward pressure on "Adjustomatic" bar progressively increases amount of card compression. You select the correct pressure for the number of cards in tray.

FULL GRIP HANDLES

When in processing or storage position, "Adjustomatic" front plate provides readily accessible, fully-sized handle. Opposite end has same-size handle, making tray easy to carry even when filled to capacity.

COMPRESSOR REVERSES

For greater flexibility, Diebold's "Adjustomatic" compressor can be removed when desired. Compartmentalizing tray is simple matter of removing and reversing compressor which provides correctly angled base when dividing cards into sections. Additional compressors can be added to form multiple compartments.

GET DETAILED INFORMATION →

DIEBOLD
INCORPORATED
CANTON 2, OHIO

Over 100 Years of Leadership

Diebold, Incorporated, Dept. OE-187
Canton 2, Ohio

Gentlemen: Without obligation, please send me complete information on the Diebold Vertical Processing Tray.

Name _____

Title _____

Company _____

Address _____

City _____ Zone _____ State _____

D10736

Circle No. 5 on Reader Service Card.

Data Processing FORUM

QUESTION: Do Manufacturers and Suppliers Give Ample Assistance to Data Processing Installations?



Don Titus
American Cyanamid Co.
General Services Division
New York, New York

THE MANUFACTURERS of equipment have always supplied assistance to companies installing data processing systems and it has been ample within the natural limitations that these companies have.

Perhaps the most marked characteristic of modern data processing is its widespread application. It is not purely an office phenomenon, since it can play a vital role in the operation of every department of a company and in the performance of every business function. In the framework of administrative processes it can play a major role in executive coordination and control. How well it is designed can have a very real effect on operating costs, production, sales, customer service and profits.

It follows that those companies who rely too heavily on manufacturers and suppliers are not being fair to themselves or to the suppliers. Those who will profit most from automation of the administrative processes will have the perception and resoucefulness to determine the logic of their own system — using the excellent facilities of the manufacturers and suppliers for instruction on the *mechanics* of data processing.

Equipment and forms manufacturers, as well as other suppliers in the data processing field, are sometimes subjected to unjust criticism for the failure of an installation to perform as well as anticipated. It should be clearly understood that the responsibility for the system rests with the company making the installation. The supplier's accountability ends with the mechanical performance or design of the unit purchased.

Needless to say, one can hardly blame suppliers

for being a little biased toward their own products. Therefore, if their competition has a product better for your purpose, it is unlikely that you will hear about it unless you have the initiative to do your own research.



Dennis Tracey,
General Manager
Material Sales
Gruen Watch Company
New York, New York

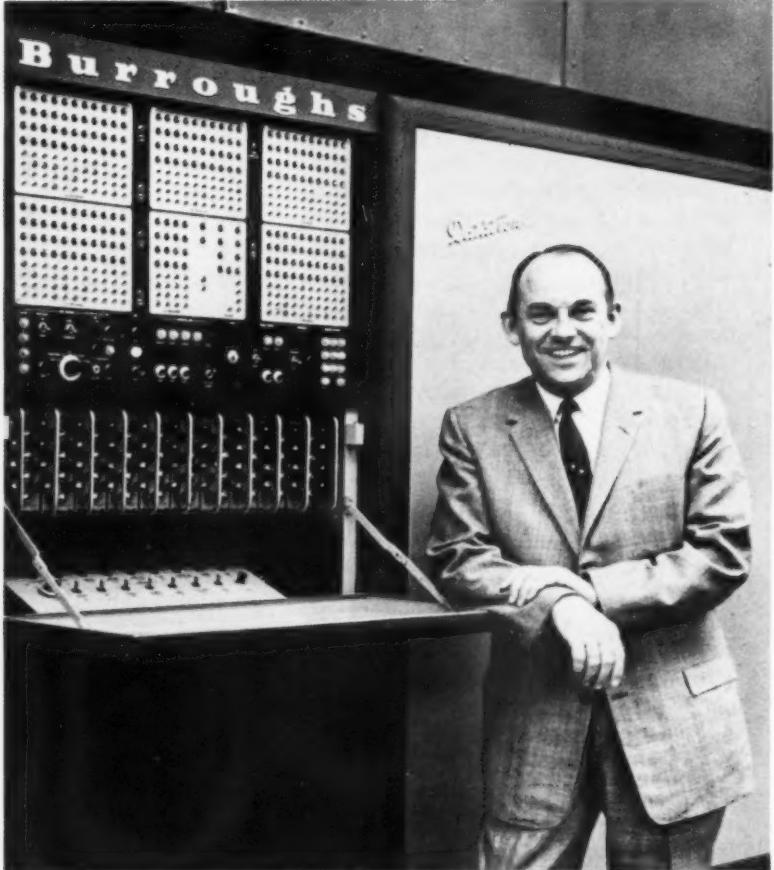
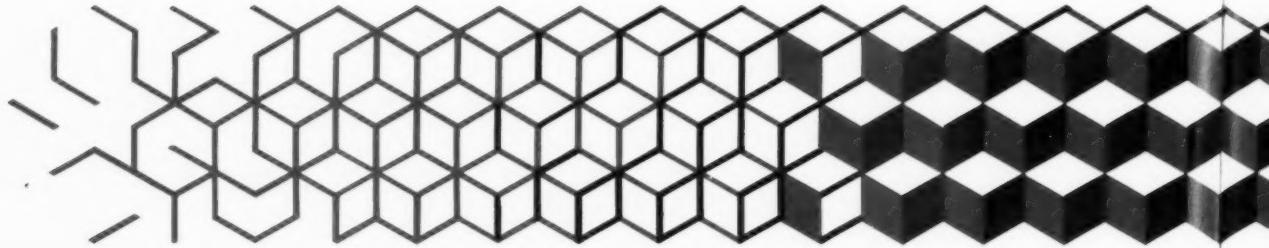
SINCE ALL EQUIPMENT associated with data processing is complex, it has been necessary for the manufacturers to provide assistance to their customers. Many times it has been difficult to secure competent assistance for a new application or an improved method of processing the work flow. However, I feel that once the system is converted and operating, it should *not* be necessary for the manufacturer to continually hold the customer's hand. If it is necessary, then something is wrong: a bad technical job on the part of the salesman, incompetence by the people in the installation, or most likely, a lack of confidence in the supervisor or manager.

It should never be necessary for systems people of the office equipment manufacturer to "live" at an installation. To be sure, there are times when a crucial situation arises wherein assistance by the manufacturer is necessary. In this instance, the relationship between the manufacturer and customer can gain a big plus if the manufacturer comes to the rescue.

Regarding the suppliers of accessory equipment, such as files, panels, ribbons, decollators, bursters, and forms: it seems that they are doing an adequate job. The forms manufacturers have been in the process of becoming systems-oriented and, by and large, are becoming a valuable source of assistance. ■

A statement from Behr-Manning Co.: "Our Burroughs

*computer processes our customer
order data in 1/50 the time"*



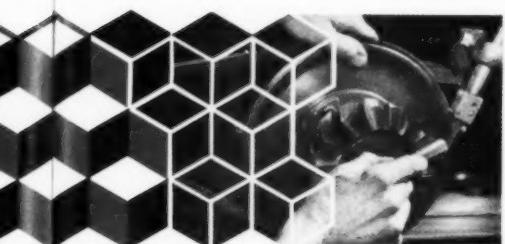
Behr-Manning's Philip Doherty (left) meets with members of his group at the Datafile.

Edwin C. Evans, Vice President and General Manager of Behr-Manning Co.

"Our Burroughs computer processes our customer order data in 1/50 the time... and provides our management with up-to-the-minute statistical reports for the control and planning of our business."

EDWIN C. EVANS

*Vice President and General Manager
Behr-Manning Co.*



Nearly 40,000 different products are manufactured by Behr-Manning Co., of Troy, New York, a division of Norton Company. These products have use in almost every manufacturing process...from the making of cars to the shelling of peanuts. The products are of three main types: coated abrasives, pressure sensitive tapes and floor maintenance products. Behr-Manning, with its parent company, the Norton Company, is the largest abrasives enterprise in the world, and Behr-Manning's cellophane and other pressure sensitive tapes, sold under the "Bear" Brand are quality leaders in their field.

Behr-Manning's vast selection of products are stocked and shipped from the factory warehouse and from 16 branch warehouses across the country. Their products are purchased by countless different types of customers through every major channel of distribution.

The company, which began as a sandpaper business in 1872, now has 3,000 employees. As Behr-Manning's line of products and list of customers grew, their record keeping and accounting procedures also became extremely complex. In November, 1958, they installed a Burroughs 205 electronic data processing system to solve their paperwork problems.

Behr-Manning's decision to purchase a Burroughs 205 was preceded by considerable investigation. Vice President

and General Manager, Edwin C. Evans, states, "We first organized a 6-man study team. The group's job was to determine whether or not a data processing program would help us, and if so, to recommend which data processing system would help us most. When we decided to enter electronic data processing, the group prepared a detailed description of our particular requirements. We settled on Burroughs equipment because the 205 best satisfied our specific needs. Furthermore, the high capacity, low-cost random access Datafiles were especially suited to our application."

The computer soon took over a number of complex clerical functions...in actuality, 19 different computational assignments, from factory payroll to budget reporting. The computer's capacity enabled it to do all of this work in only 10 hours per week.

Despite the magnitude of these jobs, this was not the chief reason for acquiring the 205. Behr-Manning's most important need is a process called "order entry," which literally automates the entire sales-inventory-billing-report cycle.

The source of all Behr-Manning operations is the customer order, which is also a source of a mass of paper work. It must be edited, analyzed and reproduced prior to completion of processing.

"All order entry, from every branch, can be done by our 205," states Philip Doherty, Behr-Manning's Manager of Operations Analysis and Planning. "We process thousands of orders a day. An original order is picked up just once at a receiving location and all the work is done automatically in the system. An order coming in from a branch office is transmitted in minutes to headquarters by private wire, quantity and item data are automatically fed to the computer, and return wire messages make stock status and shipping information instantly available to the branch office."

In addition to processing the order, the 205's magnetic tape Datafiles, each having a capacity of 20,000,000 digits of information, hold many thousands of different customer and product records. When an order is entered in the 205, the computer locates the appropriate customer and product records, then issues

either a production order or shipping instruction. It also automatically prices the order and issues the invoice. Upon completion of a customer order, the computer automatically issues factory orders to replenish the stock level of the factory or branch warehouse.

The statistics accumulated by the 205 are then prepared in numerous different reports which are distributed either daily, weekly, monthly or quarterly in a digested form for Behr-Manning management. The reports include information on sales, finance and production. Previous to the 205 these statistical analyses required as long as three weeks to prepare. Now, even the most involved report can be issued in 48 hours, and if information is needed more quickly, it can be obtained by inquiring through the computer console. In such cases, specific replies are typed automatically by the printer.

"These up-to-the-minute reports," says Behr-Manning's President, Elmer C. Schacht, "are invaluable to us in the planning and control of our business. The information obtained from one waste report alone should save us thousands of dollars a year. In addition to improving the speed and accuracy of our own operation, installation of the 205 benefits our customers with the fastest possible service."

Behr-Manning originally leased their 205 computer, but after about nine months of use, they decided to purchase it. Vice President Edwin C. Evans points out, "By June, 1959, it was obvious that our 205 would accommodate all of our 'order entry' procedures plus many of our other data processing needs. So at that time we purchased the 205 outright. The equipment had proved itself and it made economical good sense to own it rather than rent it."

Like the people of Behr-Manning, hundreds of other industrial and business users are confirming the same experience. Burroughs complete line of electronic data processing equipment is backed by a coast-to-coast team of computer specialists, all eager to tell you how Burroughs can help in your business. For additional information, write General Manager, Data Processing Systems Group, Detroit, Michigan.

Burroughs Corporation



"NEW DIMENSIONS/in electronics and data processing systems"

Circle No. 6 on Reader Service Card.



Now... "Home on Time" is a Habit!

Cardioner in the Tab Department changes overtime to free time!

Obscurely mutilated cards kept the "flow" out of this Tab Supervisor's department. Visual sorts always skipped over some of them. Machines misread. Machines jammed. Men and equipment sat idle. Often the day's work lasted into the night.

Now, a Cummins Cardioner puts "flow" in this Tab Department. Automatically it reconditions 275 cards a minute — makes crumpled cards machineable, rejects any that are stapled, taped or have folded corners. No manual sorting, hardly any misreadings — reports balance easily. Jams drop by a whopping 75%. Punching of substitutes is all but eliminated, together with re-writing, reproducing, re-verifying, refiling, rerunning, and the 6-7% errors which always occur when substitutes are punched. A single machine helps make the Tab Department a model of efficiency — good news for workers and management alike!

Send for new booklet!

See at a glance how Cardioner irons out cards, irons out the kinks in tab operations. Case histories on request.



Cummins
IN BUSINESS AND BANKS SINCE 1897
Since 1897

Cummins-Chicago Corporation
4740 North Ravenswood Avenue, Chicago 40, Illinois
Sales and Service in all Principal Cities

Circle No. 7 on Reader Service Card.



COMPUTER PROGRAMMERS are where you find them

Three Insurance Companies Erect a Bridge of Self-Help

ONE OF THE MOST IMPORTANT FACTS to emerge from the SPAN installation in Hartford is that computer programmers are where you find them. It is a prime reason why our operation is a success—and it answers a question posed by scores of firms about to move into computer processing.

The SPAN story is unusual. Basically, we are a computer service center jointly owned and operated by three competing insurance firms. We have reason to believe that we are the first successful operation of our kind in the United States.

By Ragnar E. Anderson



But getting SPAN off the ground was no tea party. And the problem of personnel was one of the first we came up against.

One of the biggest stumbling blocks to an effective computer installation is the availability of programming personnel. These people are actually the "heart" of the system.

Yet, when faced with this problem, SPAN discovered one extremely important fact:

We had to look no further than home base for a full complement of computer people.

Today the SPAN organization is a smooth running machine handling the sizable amount of processing each day. And, to a major extent, our success is a direct reflection on the people who program and run the electronic data processing system, an IBM 705.

Except for the technicians who maintain the machines, the specially trained staff at our Center has been recruited 100% from the original four member companies. When we formed in 1956 there were four participants—the Springfield Fire and Marine, Phoenix, Aetna and National Fire Insurance Companies. Since then the National has merged with a large western company which has its own data processing system.

Programming a system such as ours is an extensive job in itself. But we were actually doing two jobs: programming the computer and standardizing the cards and forms of four member companies.

As we got into the operation, though, we found that our differences were not as great as originally thought. The form and arrangement of any particular report was highly individual in each company—but content-wise each management was receiving just about the same data.

It was already obvious that going from con-

ventional punched card processing to the computer would involve change in forms and procedures. But it was also a tremendous opportunity.

As long as we were making the change, we could strive for common codes, common input, common processing and common output. The result could save us time and important costs in the planning and programming area.

These were jobs for the programmers. And, in order to carry the plan through successfully, the programmers had to understand the complicated language and habits of the insurance industry.

Recruitment Activity

With this in mind we turned to our own member companies for the necessary programmers and machine operators. The first call produced no less than 300 applicants from the four companies. They came from every department. A large number were already doing data processing work. But we also had applicants from losses, payroll, agency, underwriting, agency service, claims—and even one fieldman.

Our first job was to boil down the applicants to the score-or-so of men and women needed at our computer center. The screening process at SPAN was a series of aptitude tests, orientation tests, past record analyses and personal interviews. All of this was the direct object of locating those who had the best ability to work with computers.

Selection of programmers and computer personnel is usually a matter of finding the people who can see the big picture in terms of its detailed parts. A programmer, for instance, has to have the ability to follow through on a problem step-by-step. It is slow moving work which requires the highest degree of concentration.

Measuring "concentration ability" was the prime object in the tests and interviews. The manufacturer's EDP test, a measure of problem analysis, counted the most. With this, balanced out by the orientation test and reports from the person's supervisor, we had a pretty fair idea of the applicant's ability to work with the computing system.

It is interesting to note that our final groups were composed of people from all departments of the member companies. There was no one area where we could predict finding the personnel we needed. Our tests and interviews proved graphically that "computer programmers are where you find them."

Phases of Training

As a result, the first group of 20 applicants started training classes in July 1956. The training included one week of insurance industry orientation—with a close analysis of our own fire and casualty companies' administration and business in general.

The second phase of training brought the group

into problem definition work and the rudiments of programming methods.

A short time later a second smaller group was selected. These 13 people started training in November 1956. Finally, out of the two groups, some 25 people were graduated and accepted on the SPAN payroll.

Up to the point of actual transfer to SPAN, the applicants remained members of the four original companies. To make the change as attractive as possible, we assured all personnel that seniority rights and fringe benefits they may have accrued would be protected. Everyone was considerably upgraded in their new jobs—and at a rate much faster than would have been true in their previous assignments.

One of the most important results of personnel selection and assignment at SPAN was development of a very high *esprit de corps* and loyalty to the Computer Service organization. It is difficult to analyze this concisely, but we do have some ideas.

Reasons for Success of Recruiting Program

The process of selection itself was important. First, we put out a general call within our member companies. There was no "challenge" from the outside. Personnel knew that they were not competing with consulting "hotshots"—but with the same people they contacted day-in and day-out.

Secondly, they knew they were getting in on the ground floor. There was no fear of stepping into an established routine. On the contrary, they would design and operate their own schedules.

Finally, every man and woman selected by SPAN had the feeling of embarking on a new adventure—yet one that employed the language and customs they know intimately. These people know the fire and casualty insurance business from practical experience. Now they can put that knowledge to work in the most advanced manner possible.

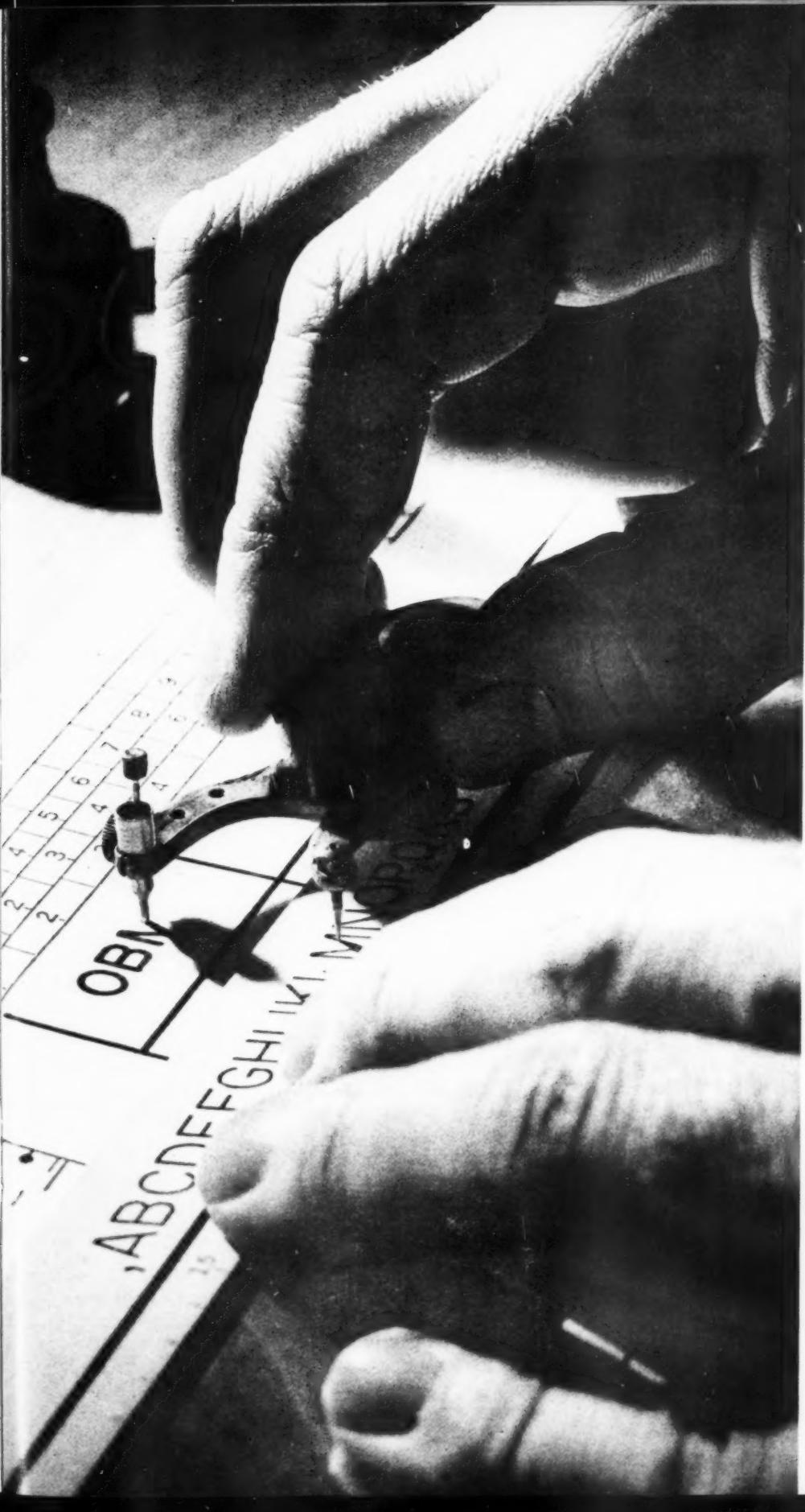
In less than two years of actual computer processing, SPAN has become a practical reality. Both our member companies and our dollar figures tell us so. And this knowledge is to the credit of every man and woman in our Center.

Possibly this anecdote illustrates our personnel situation as well as any series of facts or explanations:

During the early (*and trying*) days of SPAN we often worked well into the night. One evening a computer programmer was discovered working quietly and furiously in a back room. No one realized he was there. Furthermore, the man was reminded that his job classification did not include overtime wages.

"Hell," he replied, "this isn't a job, it's a way of life."

We found our computer people right at home—and the result has been success of the SPAN idea. ■



THE CARD WITH SPECIAL BACKING

... in design

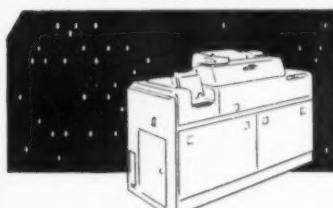
Proper card design can improve card handling, speed and accuracy, reduce card consumption, and contribute greatly to the economy of your data processing operations.

To assist you in devising the *right* card format for each and every job, IBM maintains a nationwide network of Card Design Centers. The skilled personnel at each Center are thoroughly familiar with IBM's tremendous selection of standard and special cards, card sets, continuous forms, checks and special card features. This experience and know-how are at your disposal—to aid in the economical development of your own design ideas, to recommend existing formats where applicable, and to create entirely new designs tailored specifically to your needs. Additional design assistance is available through IBM's Sample Card Center, where thousands of actual card formats are on file, by industry and application. From sample cards, sent on request, you can study and profit by the ideas and the experience of others who have successfully solved card design problems similar to your own.

The IBM card is backed by **QUALITY** and **SERVICE**, too. Through its nationwide network of Card Plants and Warehouses ... through its manufacturing experience and quality control, which are unparalleled in the industry ... and through its Supplies Specialists and Sales Representatives, who know *both* card and machine requirements ... the purchaser of IBM cards enjoys the finest in product performance and service.

This special backing makes the IBM card a value unsurpassed in the industry ... and represents one more example of the way IBM helps you to enjoy **Balanced Data Processing**.

Circle No. 8 on Reader Service Card.



IBM
SUPPLIES

CONTROL AT CELANESE

"Moore forms help us

save \$16,000 a year

in billing costs"



WALTER L. McINTOSH, Controller, Celanese Chemical Company,
a division of Celanese Corporation of America

Celanese Chemical Company's new automated order-invoice system has brought many advantages, both to the company's management and to its operating departments. These include better control of production and shipping, and centralized billing, with faster, more accurate paperwork in nine locations. The system makes possible a 25% increase in billing without extra operating costs.

The system's basic feature is automatic printing of information on specially-designed forms. Orders are processed like this: first, a customer acknowledgement is prepared on a nine-part form. This is done on an

automatic typewriter that produces a punched by-product tape, containing the order data. As copies of the acknowledgement are distributed, the tape is used to send the order by teletype to the specified shipping point for filling. At the same time, it is picked up on duplicate tape at Central Billing, where it is held until a shipping report comes in. Then the duplicate order tape is used on automatic billing machines to print the invoice on another nine-part form.

A second by-product tape is made at this time, and converted to punched cards. Data for accounts receivable, weekly sales analyses and other control functions are derived from these cards. All through the system, manual operations have been cut, reducing the chance of error to a minimum. Time is saved at every step, and the multi-part forms provide accurate copies for every office need. The forms are Moore Speediflo—the company's control in print.

"When it came to handling paperwork, the Moore man's advice was priceless," said Walter L. McIntosh, Controller of Celanese Chemical Company. To find out how the Moore man's knowledge of systems can help you get the control your business needs, write the nearest Moore office.

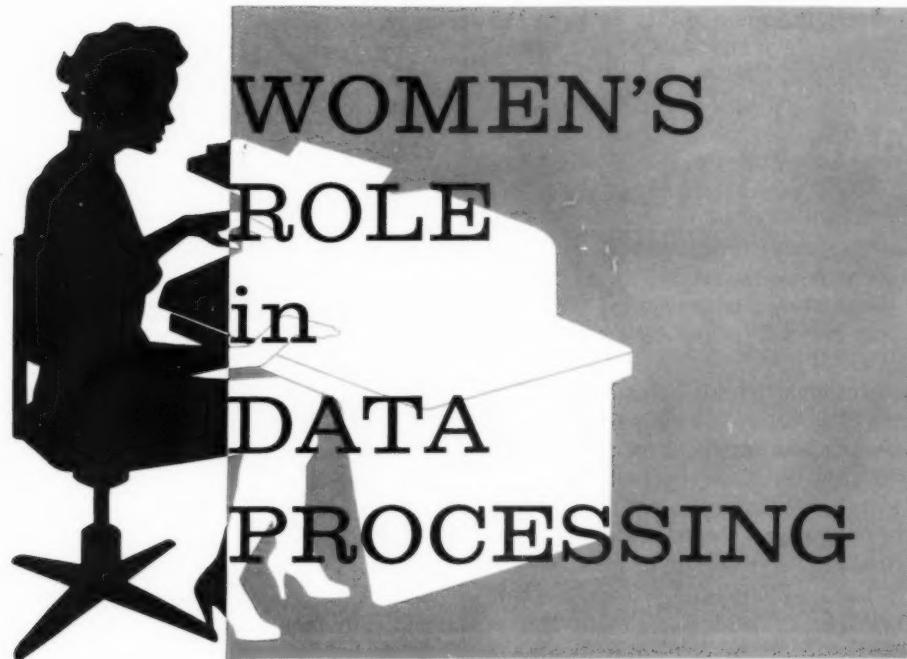
Circle No. 10 on Reader Service Card.

MOORE BUSINESS FORMS, INC., Niagara Falls, N. Y.; Denton, Texas; Emeryville, Calif. Over 300 offices and factories throughout the U. S., Canada, Mexico, Cuba, Caribbean and Central America.



Build control with

MOORE BUSINESS FORMS



The distaff side has found acceptance and opportunity in data processing perhaps as in no other function of business.

IN RECENT YEARS there has been an increasing tendency to break with tradition and accept women in work activities once regarded as the exclusive domain of men. A growing number of people are tending toward the opinion that women constitute one of the nation's most important untapped resources. Some of the forces that may hasten the acceptance of women into occupations formerly closed to them include factors such as the following:

1. Rising level of demand for workers in all categories, resulting from a continuously expanding economy,
2. Inability to find enough men to meet the demanding qualifications for executive personnel,
3. Continued progress in automation, resulting in the replacement of muscle power by mechanical power, thus opening more opportunities for those lacking physical strength,
4. Possible occurrence of a national emergency which would be likely to leave us with a scarcity of available manpower.

Concepts and Attitudes about Women in Industry

While the eventual acceptance of women as creative contributors to business progress seems assured, there is little doubt that even today women in business are subjected to a considerable amount of discrimination. Such discrimination manifests itself in one or more of the following ways:

1. Lower wage rates for women, even in occupa-

tions where they work side by side with men,
 2. Relegation to lower level jobs than men,
 3. Less opportunities for promotion than for men,
 4. Barring of considerable classes of occupations, designated as reserved for men only,
 5. Reluctance on the part of employers to make any substantial investment in the training of women.

The justification on which such actions are based rests on a number of prevailing beliefs concerning

By Geraldine M. Oxley



what is conceived to be certain distinguishing features and differences in innate ability between the sexes and the proper role of the female in American life. For those holding to such traditional concepts, women are acknowledged to have certain distinctive talents, such as greater manual dexterity than men, the ability to outperform men in routine repetitive tasks, greater conscientiousness about details and more willingness to bow to authority. Some of the less favorable characteristics ascribed to women, as compared with men, include greater turnover and absenteeism, less physical strength, greater emotional instability and lack of "drive" for advancement.

A large section of male opinion holds to the belief that the principal objective of all women is, or ought to be, a home and a family. It is undoubtedly true that the majority of unmarried women regard work as a temporary stop-gap until marriage. However, there is considerable evidence to the effect that an increasing number of women do take their work seriously; many intend to make it their career.

The claim is often made that women do not make good supervisors or managers. It is contended that both men and women prefer to be supervised by a man and that a woman is more governed by emotion than objectivity. This has resulted in a widespread and deep rooted prejudice against women occupying managerial positions. When women are entrusted with supervisory responsibilities they are much more likely to be occupying staff, rather than line jobs. The fact is, in those instances where women have been given supervisory or managerial responsibilities and, where there has been careful selection, adequate training and sufficient backing by their own superiors, they have more than proven their skill in supervising both men and women effectively.

The ability to perform well at work may be closely correlated with level of intelligence. Years of investigation by psychologists have failed to reveal any fundamental differences in the levels of intelligence between men and women. Such differences as may be observed in the work performance

are often considered to be innate, but more likely reflect variations in motivation and attitudes stemming from the different parental and environmental influences which shaped their lives from childhood to adulthood.

Opportunities for Women in Data Processing

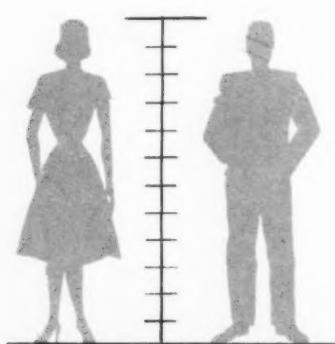
Increasing acceptance by industry is being accorded women of intelligence for career opportunities in research, science and associated fields. This is especially true in newly created occupations, where there has barely been enough time to stamp a male label on them. One such occupation that has recently sprung into prominence and is open to women as well as men is that of computer programmer.

A programmer might be thought of as a person who prepares instructions for an electronic computer, by translating the problems to be solved into a language which the machine can understand and follow. The job of programmer represents a new and challenging outlet for those who are mathematically inclined or gifted. Persons contemplating this career should be endowed with creative ability, the faculty of being able to think clearly and logically and the talent for using ingenuity in solving complex problems. A basic mathematical foundation, acquired as early as possible during one's schooling, would be excellent preparation for those intending to enter this field.

The electronic computer is a relative newcomer to the American scene. Its use for scientific and industrial purposes is widespread, and is likely to accelerate. Moreover, a steadily growing number of business firms have come to a realization of the potential that modern computers have for relieving the ever increasing burden of paperwork. For the programmer, the increased demand can only result in higher pay and enhanced prospects for advancement.

Although the initial opportunities for women in the field of electronic data processing were the result of circumstance, women quickly proved that they were as adept as men in this occupation. Since electronic data processing is still in its infancy, it is natural for companies pioneering in this field to meet and discuss common problems. Favorable reports on the success of women by companies using them in data processing have hastened their acceptance, and today it has become commonplace to find women in this field. However, for women endeavoring to become programmers, there is likely to be a very careful screening before they are accepted because of the very substantial investment in training.

It is not uncommon for a company contemplating the installation of a computer system to choose the programming staff from its employees by means of



aptitude tests given to both men and women. The successful candidates, after screening, are usually grounded in the fundamentals of the company's operations and routines for a period up to two years, if they have had little or no previous experience. Upon completion of the training period, they are sent to a programming course lasting generally from two to twelve weeks. After the completion of their schooling, they have the opportunity to work with experienced programmers for several months before undertaking a program of their own.

Those engaged in programming or related activities are considered to enjoy professional status. Salaries can be quite high for the successful and compare favorably with those of any other profession in industry. There does not appear to be much tendency to differentiate between men and women in the matter of salary, if they are doing the same job and have equal ability and seniority.

While a number of women have attained outstanding prominence in electronic data processing, it is too early to generalize about promotional possibilities in this field for women. In the department that I am associated with, we have nine women included in a total staff of 33, consisting of programmers, systems analysts and supervisors. A number of the women have been promoted in grade to senior programmers, systems analysts and supervisors. Top salary levels range from \$8,400 for the senior programmer to well above \$10,000 for the supervisory grade. For companies with as enlightened a management policy as ours, where merit and ability outweigh considerations of sex, it would not appear to be outside the realm of possibility for women to become managers, or the equivalent, of electronic data processing units. The normal climb in the promotional ladder from the ranks of programmer in ascending order might be: Senior Programmer, Systems Analyst, Supervisor, Manager, Executive.

Women have proved, at least in the field of electronic data processing that, given the opportunity, they can compete successfully with men.

■ ■ ■

REPRINTS AVAILABLE

"An Alphabet of Morale Building,"

Samuel Towsen's treatise
on improving personnel
utilization, is now available
in reprint form.

Single copies, 30c each.

Prices for quantities on request.

- speeds labeling...outperforms old-fashioned addressing 4 to 1
- increases efficiency of tabulators... saves time and money
- sticks without moistening...adheres quickly to any smooth clean surface

JUST 2 SIMPLE STEPS...

FIRST—as the tabulator imprints Avery Tabulabels they smoothly rewind themselves into easy-to-handle rolls.



SECOND—an Avery electric dispenser completes the cycle—and the imprinted Tabulabels are dispensed quickly, easily, neatly!

THIS IS AN AVERY TABULABEL

1 Drug chain codes thousands of warehouse items on bins and shelves with Tabulabels.

THIS IS AN AVERY TABULABEL

2 Mid-West farm equipment mfg. boosts imprinting from 120 to 400 labels per minute.

THIS IS AN AVERY TABULABEL

3 Giant West Coast bank addresses 7000 packages of travelers checks daily to world wide destinations.

THIS IS AN AVERY TABULABEL

A few market-tested uses for Tabulabels:
Addressing envelopes—bin and shelf
markers—identifying products and cartons
—inventory control—part number identifi-
cation—labeling file folders—and you may
discover others!

IT'S A TABULABEL



try them today!

write for

FREE samples now.

AVERY LABEL COMPANY Div. 183

117 Liberty St., New York 6 • 608 So. Dearborn St., Chicago 5 • 1616 So. California St., Monrovia, California • Offices in Other Principal Cities

my name _____

company _____

address _____

city _____ zone _____ state _____

Circle No. 12 on Reader Service Card.

NEWS SUMMARY

GENERAL

Bendix Name Change

The stockholders of Bendix Aviation Corporation voted to adopt a new name — "The Bendix Corporation." The name was changed to emphasize Bendix's diversity of products and services.

Burroughs and BLESSED

Burroughs Corporation's world-wide revenue in 1959 increased 22% to \$359,778,068 compared to \$294,085,000 in 1958. Earnings after taxes amounted to \$10,745,369 before a non-recurring write-off. Net income in 1958 was \$6,407,934. Earnings in 1959 were \$1.62 per share, against \$1.02 for 1958. Burroughs, a consultant and user combined talents to create a new automatic programming system — BLESSED — for Bell Little ElectroData Symbolic System for the ElectroData 220 computer.

C.E.I.R. announced the formation of C.E.I.R. Ltd. in London. The organization will provide the same services as those of the parent U. S. Company.

Dennison Manufacturing Company has voted to recommend declaring a 100% stock dividend to its holders. Their sales were \$43,391,000 with earnings of \$2,219,000 for a per share rate of \$3.46.

General Electric's Computer Dept. announced a 5-year lease plan for its A-C network analyzer. The rental will be \$180.00 per month.

The National Cash Register Company announced plans to establish a nationwide network of data processing centers. Three such centers will be opened in 1960, in New York, Los Angeles and Dayton, and others will follow in 1961. Net income of NCR in 1959 rose 23% to \$19,076,000, compared to 1958's \$15,512,000. Sales rose from \$393,746,000 to \$419,064,000 and earnings from \$2.19 to \$2.52 per share.

Philco Corporation announced price reductions on its transistor line of up to 52%.

Royal McBee Corporation reported six months' sales of \$53,206,000 vs. \$49,010,000 in the same period in 1958. Net earnings were \$898,000, equal to .47 per share.

Sales of *The Wright Line, Inc.* were \$6,045,048 in 1959 vs. \$5,395,858 in 1958. Profits were \$530,093 or \$1.43 per share vs. \$427,388 and \$1.15 a share in 1958.

NEW APPLICATIONS

Processing Trades

Minnesota Mutual Life Insurance Company is using its Burroughs 205 computer system to prepare detailed *interim and annual financial statements*.

Merrill Lynch, Pierce, Fenner & Smith, Inc. plan to process trades from branches in 116 cities on an IBM 7080 system. The tie-in, which will be worldwide, will involve processing 20,000 trades on 440,000 active accounts. The system will also process the monthly *P & L* and comprehensive *statistical analyses*.

American Thread Company shifted its operations to an IBM RAMAC 650 tape system for processing *billing and sales analysis*, to be followed by *inventory control, budget analysis and production planning*.

Bankers Trust Company of New York announced the projected conversion of its *demand deposit accounting system* to an IBM 7070 data processing system, to be completed in 1963.

Harris Trust and Savings Bank unveiled a Univac Center to process *demand deposit accounting and bookkeeping function*.

Mrazek Moving and Storage Co. of St. Louis, Missouri has installed *McBee Keysort equipment* using marginally punched cards. The heart of the system is the *Keysort Tabulating Punch*. *Payroll, mileage and costing data* are the primary applications.

The *Transacter System* of Stromberg was used to collect attendance data at the sixth annual *AMA Electronics Conference*.

Automatic Re-Order System

Coats and Clark uses Underwood-Samas punched cards to maintain customer inventories and simplify customer reordering.

THE PARENT COMPANY, J & P Coats, Ltd., started operations in Scotland in 1812. Shortly thereafter Clark's Sewing Thread was introduced to the women of America by the captains of British sailing vessels. Our first cotton mill in this country was opened in Newark, New Jersey in 1864. These products are distributed directly to retail stores and, to a lesser extent, through wholesalers. While a substantial part of the business is in industrial sewing threads sold to manufacturers of certain products, this phase of the business is not concerned with the application described.

Situation

The problem is unique in that warehouse and nine branch stocks are maintained for approximately 3,400 items and individual customer stores which number in the tens of thousands. While no one store stocks all 3,400 of our items, single retail outlets do carry a substantial portion of the complete line.

By Arthur W. Napolitan



The traditional method used by customers to place orders for merchandise was the same as that used for other product lines. This involved the laborious task of "on handing," which refers to the operation of taking a physical inventory of the counter and reserve stock in the store, comparing same with the previous inventory and, after making allowances for goods received, determining the sales in the intervening period. This operation can be plain drudgery and, because of lack of help or inexperienced help, stores would allow their stocks to become depleted simply because they did not "on hand" often enough. This would cause numerous stock-outs resulting in loss of sales by the store and by Coats & Clark. We realized that a simple means of reordering must be developed for the benefit of our customers and ourselves. It was obvious that some form of mechanization was indicated. First, it was necessary to list the objectives:

1. The system should be simple to operate at the store level, minimizing or eliminating the necessity for "on handing."
2. The punched card or ticket used must be small enough to fit into the smallest size box of thread without folding the card.
3. The cards should not require reproduction to normal size punched cards before being sorted and processed.
4. The total cost of the system, namely in cards, machine rental and operating cost, should be the least expensive of several alternatives.

While we have a mechanized invoicing procedure using IBM equipment, integration of the re-order system into the billing operation was not a requisite, due to the nature of the business and invoicing requirements.

We consulted with our major customers on this problem and worked with them in arriving at the solution. We investigated all data processing hardware available and, after study and consultation with machine suppliers, finally decided upon the use of the Underwood-Samas equipment which fulfilled the four requirements listed above. Under-

wood-Samas modified some of the machines to suit our special requirements.

The System

We use the basic 36 column Samas card, including a stub. Upon removing the stub, a standard 21 column Samas card remains. Master cards were prepared for each of the 3,400 stock items. In addition to descriptive information, a sorting code was punched into the cards. These master cards are used to reproduce the required number of re-order cards using the Reproducer. The cards are then processed on the Interpreter. At the final boxing operation in the mill one reorder card is placed in each box of merchandise. This completes the operation as far as the mill is concerned.

At the store level, we recommend that the store manager take the time to set up basic stocks representing a given number of weeks' supply of each color based on the expected sales activity of the particular item. After the stocks are brought into line, the system is ready for operation at the store level.

When a box of merchandise is transferred from the reserve to the counter stock, the reorder card is removed by the sales clerk and placed in a metal receptacle. When the scheduled date for reordering arrives the office clerk removes the reorder cards from the receptacle and detaches the stubs from the basic card. A rubber band is placed around the stubs and they are retained in the office for record purposes until the merchandise is received. Envelopes pre-addressed to the servicing branch are stored in the rear of the metal receptacle. These envelopes have an Addressograph plate impression in the upper left hand corner indicating the store name, number and address. The basic reorder cards are inserted into the envelope and mailed. This completes the operation of reordering at the store level.

Activity at Company Branch

When the envelopes are received in the branch, they are opened and the cards removed. The cards are then sorted using the 21 Column Sorter. Sorting codes are provided to minimize the time required. During this operation the envelope remains with the cards, as it represents the only identification of the store forwarding the order. The cards are then processed on a special two copy order form which is then Addressographed with the customer's name, number and address (*from card envelope*).

The order is picked and one copy of the form is used as a packing slip. The other copy is forwarded to the branch office for invoicing. Upon receipt of the merchandise by the store, the transaction has completed a full cycle and will continue to operate on a "continuous chain" basis.

From the above, it may be determined that the necessity for "*on handing*" to place an order has

been eliminated. In fact, the store has placed an order with us without being required to use a pencil, pen or order form.

Actually, in the normal course of business, certain variations of the above standard procedure are required. While our system is automatic, the human element does remain a factor in the success of its operation. In the first place, the store should take periodic inventories for the sole purpose of adjusting their stocks to allow for varying seasonal requirements, new colors, and lost or mislaid cards. For this purpose supplementary order forms are supplied in the rear of the receptacle. These are also pre-Addressographed with the store name, number and address. The store clerk lists on this form whatever additional items they require. The form is designed so that it will fit into the reorder card envelope and is included with the reorder cards when they are forwarded to our branch.

Upon receipt in the branch, the supplementary order form is removed from the envelope and reorder cards are removed from the Reservoir File for the items listed, added to the deck of cards received from the customer, and processed through the sorter.

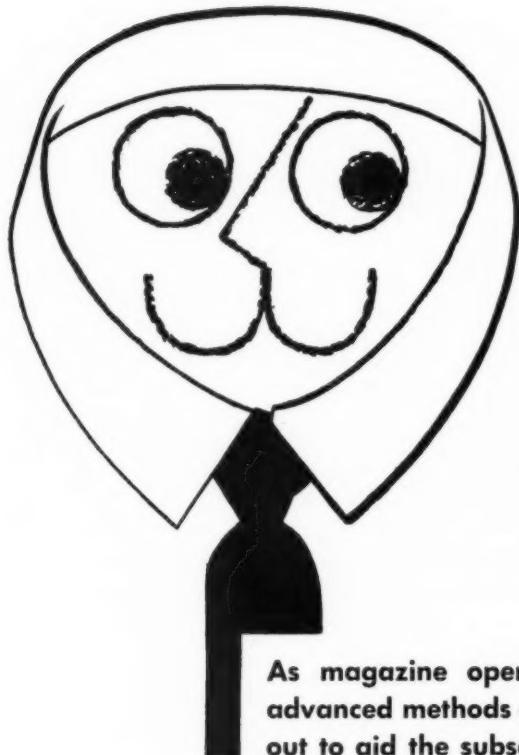
Because it is necessary for the "*continuous chain*" to remain unbroken, should the branch be out of stock of a particular item, they return reorder cards to the store in a special envelope, requesting the sales clerk to place the cards in the metal receptacle. They are included in the next order forwarded to our branch. The basic stock at any particular moment consists of: 1) store reserve stock, 2) store counter stock, 3) reorder cards in receptacle, 4) reorder cards in transit to the branch and 5) merchandise in transit to the store.

All major chains use this Coats & Clark reorder card system. In fact, one variety chain, which formerly warehoused our merchandise, changed over to direct shipment to their stores in order to take advantage of this procedure. The participation by independent retail stores exceeded our expectations. Stock-outs at the store level have been virtually eliminated, resulting in increased sales and profits.

From the mechanical standpoint, the system has worked extremely well. Surprisingly, the incidence of mutilated cards received from customers is a negligible factor. However, it is well to remember that machines represent only the hardware in a system and to be successful, *careful and comprehensive pre-planning is required*.

After two years' experience, we have concluded that in the few instances where the system has not functioned correctly, *human error* was responsible in the great majority of cases.

■ ■ ■



Electronic Data Processing and Subscription Fulfillment

**As magazine operations become more flexible,
advanced methods of data processing are reaching
out to aid the subscription fulfillment department.**

WE AT ESQUIRE believe that we have come a long way in the development of subscription fulfillment. It has not been an easy task.

Six years ago the entire Esquire Inc. subscription list comprising all three of our publications — totalling some 1,800,000 names — was on hard metal plates. Our publishers had laid out a program of growth that we knew was going to take our subscription list to about two and a half million and we were faced with the problem of either building additional facilities to handle these metal plates with their back-up of expired and prospect names also on metal plates, or change systems.

The decision was made to convert our list to a punched card vehicle being addressed through electronic-facsimile equipment on the finished dick strip and finished promotion pieces.

About two years ago our subscription list hit the 3,000,000 figure and again was backed up with tremendous quantities of prospect and expired names which had to be used for promotion. Consequently we were again faced with the decision of either building additional work and storage areas or converting to a new system. And again — after thorough study — the decision was to convert.

Now we are very close to the ultimate in efficient handling of our subscription lists with the use of magnetic tape as the storage device for names and

a completely electronic printer for taking that material from magnetic tape and imprinting it on paper. (I say that we are close to the ultimate because at the moment and in the immediate foreseeable future, it would appear that magnetic tape is

By J. M. Arnstein



the ideal storage device. On the other hand, at present the methods of putting material on magnetic tape are still in somewhat of an embryonic stage and I believe that further progress will be made.)

We have accomplished two growth objectives through the introduction of this type of fulfillment and one is that we are addressing our dick strip at the rate of 35,000 names per hour per machine compared to a maximum of 7,000 names per hour per machine on the punched card system.

Subscription Fulfillment Responsibilities

In analyzing what is meant by entering and maintaining subscriptions, particularly as it applies in the specific area of direct mail, we must agree on what a subscription fulfillment department should do.

To simplify it to its basics, the initial area is one of so-called order-entry and all that those *few* words encompass. Second is the area of list maintenance with the resultant difficulties that develop with changes of address, cancellations, collection activities, etc., and third is the ultimate of the circulation cycle — the sale and promotion activities that must be carried on in two separate phases: 1) new order promotion using prospect lists that are either available in your own house or those that you procure outside and 2) the development of renewal orders from current expirations.

Let's get down to the nuts and bolts of this electronic operation, its advantages and disadvantages as we have found them so far.

If you will think first of the metal plate system, you will probably recall that this provides an excellent dick strip for mailing copies of publications. But, whether you are a large or small publisher, this system is restrictive when you start promoting expiries for renewals.

The Punched Card System

The immediate advantage gained from punched cards was the ability to address the monthly dick strips at the rate of 7,000 per hour per machine. Secondly, space requirements shrank by more than 50%. Third and most important, the advantage of extreme flexibility in renewal promotions was gained. For the first time our expirations could be efficiently promoted in a manner tailored to each source. As addressing of the current issue was finished each month, the expiries up for promotion were broken out and separated by months. Then these months were broken down into the various sources from which the orders originated — direct mail, field agents, paid-during-service, gift, bulk, etc. Some of these categories were further refined, such as direct mail into regular rate and short term rate. By testing, it was found that some sources were far more renewable than others. In

one case it hardly pays to give the subscriber a courtesy notice where to another source we can send thirteen efforts, all at a profit. Currently, the expirations of each month are broken down into eleven different groups. To each of these eleven groups we send from one to thirteen different renewal efforts, all spaced at varying intervals. This means each month's expires receive a total of 44 letters over a period of six months. Because of this flexibility it has been possible to tailor renewal letters to fit each situation intelligently. This has paid off handsomely in better subscriber relations as well as in dollars and cents.

After the 44 different promotion efforts were addressed, the punched cards were then mechanically interfiled back into their proper geographic sequence in the main deck. Once more the master file was complete and ready for running off the monthly dick strip.

Promotion-wise, the punched cards were the answer to any direct mail man's prayers. But, they did not create an equally pleasant situation for the fulfillment manager. He found that his list — except during the addressing run — was usually in a dozen pieces. Although the punched cards were more pleasant and conducive to better morale among the workers, the system was still plagued with many of the same old human errors. In addition, it was found that even with punched cards, the lists were growing once more to unwieldy proportions. As new breakdowns were being requested by the promotion department, less and less time was left to maintain the list and create the required magazine addressing strips. The two departments frequently came to daggers points.

The Magnetic Tape System

We decided to convert, this time to tape. Once more the speed of creating the monthly magazine labels was increased — this time from 7,000 to 35,000 per hour. Space requirements shrank to less than 20% of the punched card space.

Space and time savings were gained without losing the flexibility of selecting names by source from the list. But instead of the old mechanical methods used to break down the master list, it can now be run through a computer which, by electronic selection, reproduces the segments of the lists desired.

After the promotion run, one has on one hand the intact master tape exactly as it started out, ready to use again; on the other, a couple of dozen smaller tapes, each containing those names selected by sources and expirations. These tapes are then fed into electronic printers which address the various promotions.

Actually the conversion to tape, as far as the promotion department is concerned, has provided two new and important things: 1) more time in which

to use the master list between monthly die strip addressings and, 2) a greatly improved addressing job on the promotion pieces. The addressing is very clear and is a marked improvement over the old electronic scanner or metal plate processes.

One other fringe benefit should be mentioned since it helps the whole department in its planning. During any month's run, the master tape can be fed through the computer and it will make an exact count of the upcoming expirations — for the next year, if desired — by source. As can easily be seen, one can order promotion materials in economical quantities, and plan print orders well in advance with a feeling of greater security.

Conclusions

This new system, however, is certainly no panacea for fulfillment managers. It presents not only numerous problems that never existed before but is dependent upon tremendous quantities of names being processed and addressed daily to develop peak efficiency.

This to a large degree is not a system that can be well afforded by a single, small or medium-sized publisher for he simply does not have the ability to procure the specialized labor that is required to back up a system of this sort or to procure the highly specialized and expensive equipment that goes with it. But the small and medium-sized publisher must become aggressive and take full advantage of the economies and efficiencies that are available. These publishers must create their own opportunities so that more universal use can be made of the operating economies available and also make possible further research for improved equipment available to all of us from the manufacturers.

Just as national distributors and partnerships exist on the newsstand side, similar organizations can be formed to operate on the fulfillment side. Where one small publisher cannot afford it, three can — if they pool their fulfillment operations. If the three can expand to five, so much the better, for the larger the installation and the more intensively the equipment is used, the greater the economy realized by the participating publishers.

The opportunity is here for all if more is learned about how to use this new equipment efficiently and how to cooperate with one another so as to realize the maximum advantages.

Additional profits to the magazine publishing industry can come from either of two points, increased sales dollars or lower costs, and at Esquire we are firmly convinced that additional profits can and will accrue to our corporation through greatly reduced fulfillment costs on our publications as a result of taking advantage of the labor saving and dollar saving devices that are available. ■

CORRECT KEY-PUNCH ERRORS

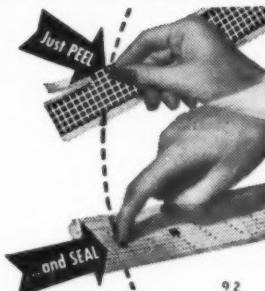
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92

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27



IBM INSTRUCTOR OUTLINES PRINCIPLES OF DATA PROCESSING TO CUSTOMER EXECUTIVES.

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BALANCED DATA PROCESSING



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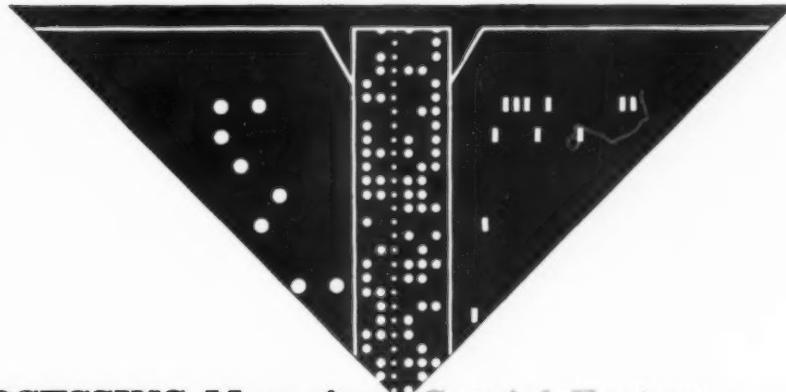


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THE SCOPE OF



A DATA PROCESSING Magazine ▶ Special Feature



DATA PROCESSING

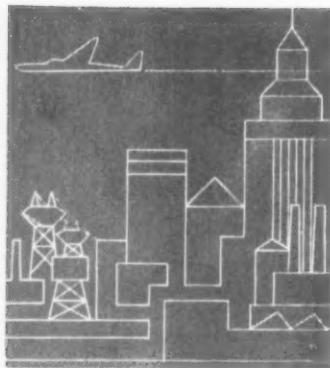
DEVELOPMENTS IN DATA PROCESSING have progressed at such a rapid pace in the past ten years that one can easily get lost "looking at the trees while losing sight of the forest."

There is great value in stepping back occasionally to view the field in its entirety as an artist does in evaluating the progress of his canvas. This can give you a new perspective, gained from seeing the proper relationship of each part to the whole.

This report hits the high spots. Along with recognizing the progress that has been made it points out certain problem areas.

It has been prepared with an eye toward brevity so that you may cover the entire report in one reading — otherwise it would defeat its purpose.

"The Scope of Data Processing" has been inserted in such a way that you might easily remove it from this issue and route to other persons who have either a primary or marginal interest in data processing — especially management men who most need a general review on this subject.



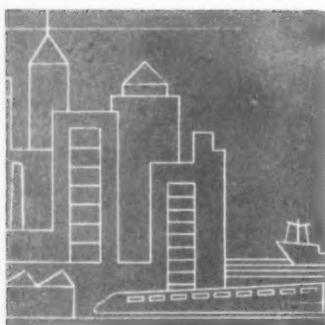
DATA PROCESSING now touches and influences all levels in all areas of American life. It has been used to track satellites, score Olympic Games, control drug development, process payroll, play cupid, tally election results, process the census and forecast the economy. A tiny particle of the atom, the electron, has generated a multi-billion dollar industry that apparently has no limit. All of this did not happen overnight, but it seems as though it has. Punched cards, punched paper tape, magnetic tape and computers have been the tools of data processing's progress. Systems, methods, procedures, and programming have been the techniques of data processing. Effective use of both tools and techniques has resulted in more efficient and economical operations.

Speed - Cost

Although it may increase profit, speed alone will not reduce clerical cost. Increased speed, indiscriminately used to improve an old system, will result only in processing the old system faster with all its inaccuracies, waste, and weaknesses. Overhauling, revamping or developing completely new systems and then applying speed where indicated will result in efficient systems at less cost.

Retailers

Department stores, chain stores, etc., seem to be the forgotten industry in data processing. Yet their margin of profit is so slim that they are a prime potential for data processing equipment and techniques. There are many areas in retail accounting which can and should be automated to provide effective management data. These areas can readily be converted using existing equipment and techniques. A large stumbling block has been point-of-sale recording, but there are devices available which will automatically capture data as it is being keyed in. It seems that many retailers are uninformed and/or hesitant to take the first step. There are many instances of effective use of data processing techniques and tools, such as Macy's, A. S. Beck Company, and Lerner Stores, to name a few.



Communications

The use of telephone, telegraph, and radio facilities in data processing is becoming more pronounced. Large multi-site companies

which are committed to decentralized management are centralizing the automatic processing of data. In order to achieve timeliness of recording, processing, and reporting, they rely on leased wire facilities from the communications utilities. The data processing equipment manufacturers are supplying the conversion and terminal units to achieve improved data communications.

It is now practical to transmit data directly from magnetic tape, punched cards and paper tape to like units or directly into a central processor. The distances span the length and width of the country. The U. S. Government is in the process of establishing a global system in connection with national defense. Further indication is the growth of the leased wire division of Western Union especially over the last five years.

Problems in Data Processing

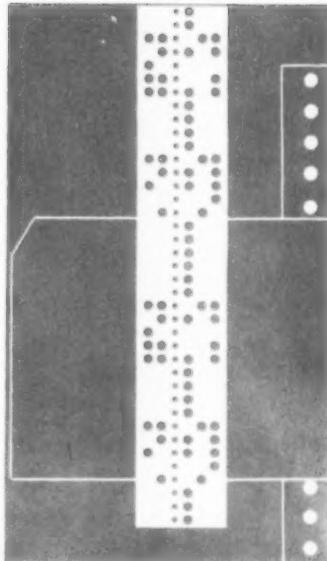
Originally, punched cards, paper tape, and electronic computers were utilized to solve the basic problem of the mounting paperwork. The solution of this problem by the tools of data processing created its own problems, and solutions to these generated still more. The initial problem any organization faces is: whether to "automate" or not. If the answer is yes, here are some of the resulting questions that must be answered and problems to be solved:

1. To what extent?
2. Which applications?
3. Whose equipment?
4. Will it save money, and/or yield significant information?
5. Conversion problems?
6. The new department organization.
7. What about sound accounting and audit features?
8. Hire outsiders — use our own personnel?
9. How much assistance is available and from where?
10. Since everyone else is fully occupied, who should head up the initial survey and follow through?
11. How much space and accessory equipment are required, and how much and how fast will this grow?

These are some of the more important problems to be solved, and, depending on the circumstances, there are scores of others. Answers to these can and must be found in order to gain the advantages of high speed data processing. There is the necessity for securing information, advice, and experience in an orderly manner. No single answer fits all of these problems. They vary from situation to situation.

Preparing for a Computer System

Once the decision is made to install a computer, the immediate problem becomes, where will it be housed? Some companies erect





special buildings. Most utilize existing space by rearranging departments. The equipment manufacturer is the best source of answering questions as to space, lighting, air conditioning, floor loads and electrical requirements. Several organizations are now in the business of providing specialized services for installation of computing systems. For a fee, they will advise on, and supervise if desired, all the details of preparing for the computer. A company may decide on a multi-pastelled, all-glass showcase, or an efficient, compact installation.

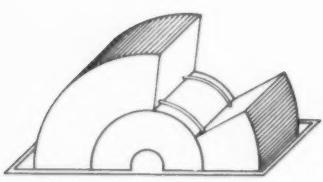
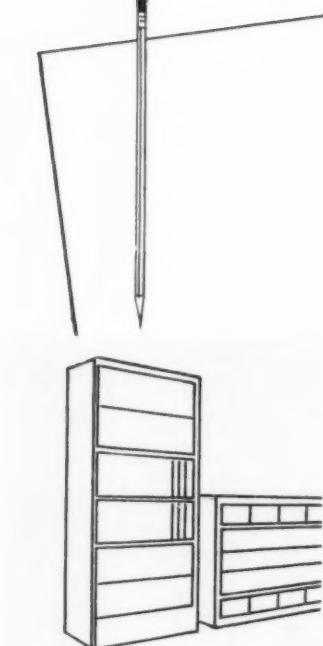
Some other considerations are an auxiliary power supply, technicians' work area, accessory equipment and storage areas, programming and discussion areas and adequate work space. There are several very good texts available to shed some light on these problems.

Scientific Management

The use of scientific methods in business management is definitely on the increase. Many of the techniques and startling results achieved have been recorded. Great progress has been made in analyzing reams of sales or distribution statistics. The speed of computers has enabled the methods of science to be effectively applied to business data to give management more meaningful reports. The use of games and simulation is gaining in acceptance, not only to sharpen and supplement management's acumen, but also in the training and selection of new employees, and determining the promotability of middle management. There are several games which can be played by individuals using pencil and paper. These help to explain the principles of interaction which are more involved in the sophisticated computer type games.

The future of operations research, simulation, and gaming is secure; scientific management will become the rule, not the exception.

Accessory Equipment



The perennial problem in a data processing installation is how and where to file cards, tapes, forms, panels, procedures, ribbons, etc. This phase of data processing is often a chronic obstacle to an efficient data processing installation. The requirements of storage and work areas are often postponed to last and least consideration, in order to get on with the processing operations. Lack of planning and consideration to this phase can lead to overcrowding, loss of space, and misfiling of the valuable data. Work space in most areas is, of course, very expensive. Often a rearrangement of machines and accessory equipment will enable an installation to grow without taking additional space. It is necessary to devote time to the layout and work flow of the installation and then utilize the accessory equipment to the best possible advantage.

At long last, the data processing department is coming into its own. It is no longer relegated to the least conspicuous or most remote area of the office. That this department has come of age is well attested by the great advances made in the exterior design of machines as well as accessory and peripheral equipment.

The Input Problem

For a long time there was much discussion about the input-jam. The conventional method of keypunching cards and then converting these to magnetic tape was a prime cause of large data processing installations not being able to fully utilize the tremendous speeds of computing systems. Many companies were losing valuable time in capturing source data on punched cards for machine processing. Mark-sensing is one solution, but it is limited to the amount of information that can be contained on a card.

Punched paper tape has provided the answer to some of the input problems. A typist preparing an invoice in a branch office simultaneously prepares a punched paper tape with only selected data, as is required for subsequent processing. At the end of the day or week, this tape is either converted to punched cards, or the paper tape is fed directly into a computing machine.

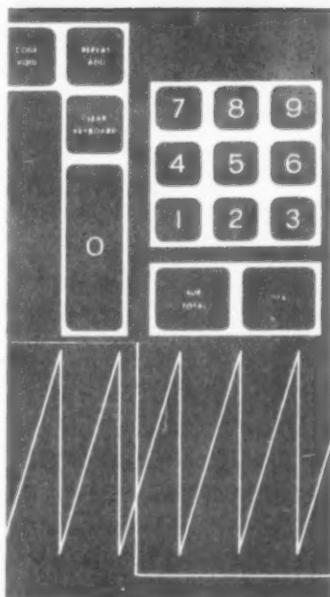
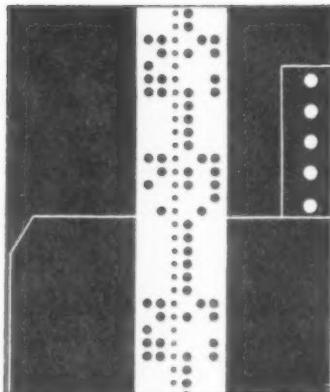
There are now devices which permit data being recorded on typewriters, adding machines, and bookkeeping machines to be captured simultaneously on punched paper tape and/or punched cards. These tapes and cards are subsequently processed for a variety of applications and reports.

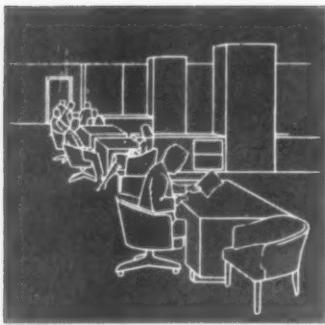
The process of Magnetic Ink Character Recognition has provided another solution to the input problem for some. Several manufacturers are making special processing equipment to read the specially developed ink. The volume of checks in banks has grown steadily and an easing is not in sight. Since MICR can be both visual and machine readable, it offers banks an ideal medium for processing and control. Also, the equipment which reads MICR is connected to a central processor, which automatically posts—once sorting and breakdown sums are complete—and updates, calculates service charges and signals overdrawn accounts for bank management.

Deposit slips are handled in a similar manner. Banks can now achieve complete processing of demand deposit accounting, balancing and reporting after the close of one day's transactions and prior to the commencement of the next day's. Also, there are banks utilizing the punched paper tape concepts related above, for demand deposit accounting; since all batches of checks must move with a control tape, a card or paper tape punch can be attached to the adding machines.

MICR is not limited to banking applications. The insurance and retail industries are scrutinizing it for adaptation to their requirements.

On the frontiers of the Input area is optical scanning. Some gasoline credit cards utilize a form of this in which the scanners are coupled to card punches and the resulting punched cards are processed for monthly bills and other reports. One manufacturer in cooperation with the government has provided direct input from a typed page—it is a special type font on special paper and must meet certain specifications. Another company has developed an experimental scanner which will "read" handwriting as long as it follows certain dimensions.





Service Bureaus

The biggest users of service bureaus are organizations that have the largest installations of data processing equipment. The Federal Government is the largest single customer. The top 500 companies in the United States plus many state and city governments, all use service bureaus and are a prime source of repetitive income to these organizations. These giants realize that no one organization can profitably maintain all the equipment and personnel necessary for all of their needs. There are one-time, occasional or unscheduled reports to be processed. The most logical way to process this special data is with a service bureau. The cost of maintaining excess equipment on a year-round basis in order to handle peaks is not economical. This has been proved through experience by these large service bureau users. Many small companies which cannot maintain a complete installation of their own, procure only source-capturing equipment such as card or paper tape punches and then have the data processed at a service bureau.

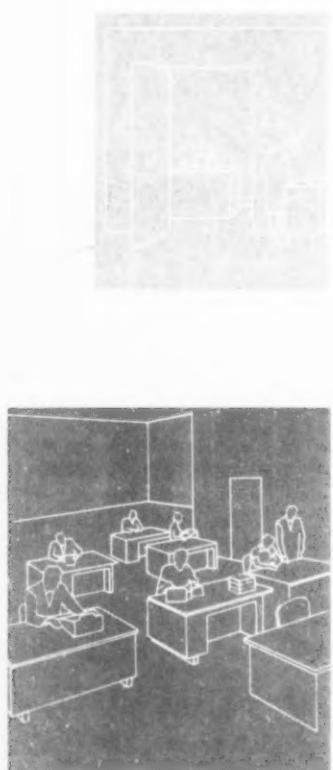
Whether an organization is large, medium or small, it is necessary to use some common sense in service bureau relations. The customer must define what he wants, when he will provide the data and in what form. He must understand how long the processing will take, and when he can expect the completed work. It is as if he were using his own equipment and personnel and the same costs he would experience are being charged to him by a service bureau. These may include forms, panel wiring and storage, card supplies, testing, set up, overtime rates, delivery charges, etc. This is in addition to processing charges which depend on the volume.

Special Equipment

Your problem isn't the same as anyone else's but usually existing equipment and techniques can solve it. There are a few situations where existing methods are not adequate. Sometimes it is a case of waiting for new developments or initiating effort to secure special purpose equipment. First you must define what is needed and then sell the validity of your need to a manufacturing firm. The latter must then invest time, money, talent and effort in developing the equipment. Part of this effort is to foresee a use for this special equipment in other areas. This is necessary to spread the high initial research and development investment.

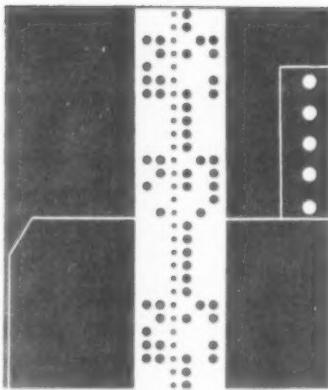
Education

The number of colleges and universities offering courses in punched cards, paper tape, computers and systems and procedures is



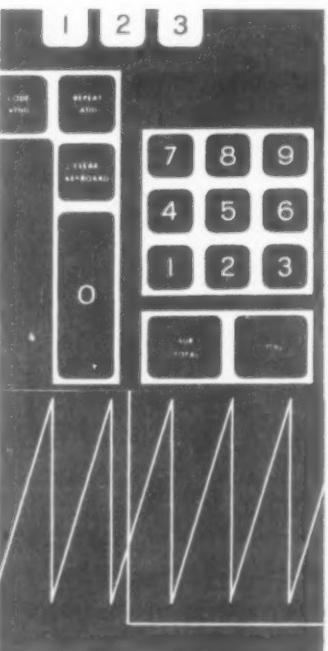
growing at an accelerating rate. There are even some secondary school systems offering courses in data processing.

The Federal Government, in an attempt to speed up the educational process, has placed emphasis on data processing techniques since the tools of this field also relate to scientific areas, space science and nucleonics. Many state education departments are also reorganizing syllabi to this end. Adult education courses in leading institutions have prepared the way to a great extent for they allow persons who work by day to learn of new developments at night. There are also several good correspondence courses devoted to data processing exclusively. Many industry schools such as those operated by banking and insurance associations include courses on data processing.



Department Managing

One of the biggest day-to-day problems in data processing departments is that of managing. Many data processing departments manage the paperwork flow of other departments soundly but cannot handle their own internal problems. Frequently the manager of a data processing department is all too ready to yield to other managers and personnel in his own department because he lacks leadership ability. This handicaps the manager in his relations with higher management and his own personnel. The manager who is aware of this deficiency will take steps to correct it. Leadership is a skill—it can be learned through proper education or application. Data processing managers can become executive officers. They, better than anyone else, know a company's operating costs—the one sizeable area left in which to achieve cost savings and more efficiently process expanding volumes. There are today data processing managers who are one step from vice presidential status. Others are assistant controllers, assistant cashiers and assistant treasurers. Their next move is to controller, cashier or treasurer.



Consultants

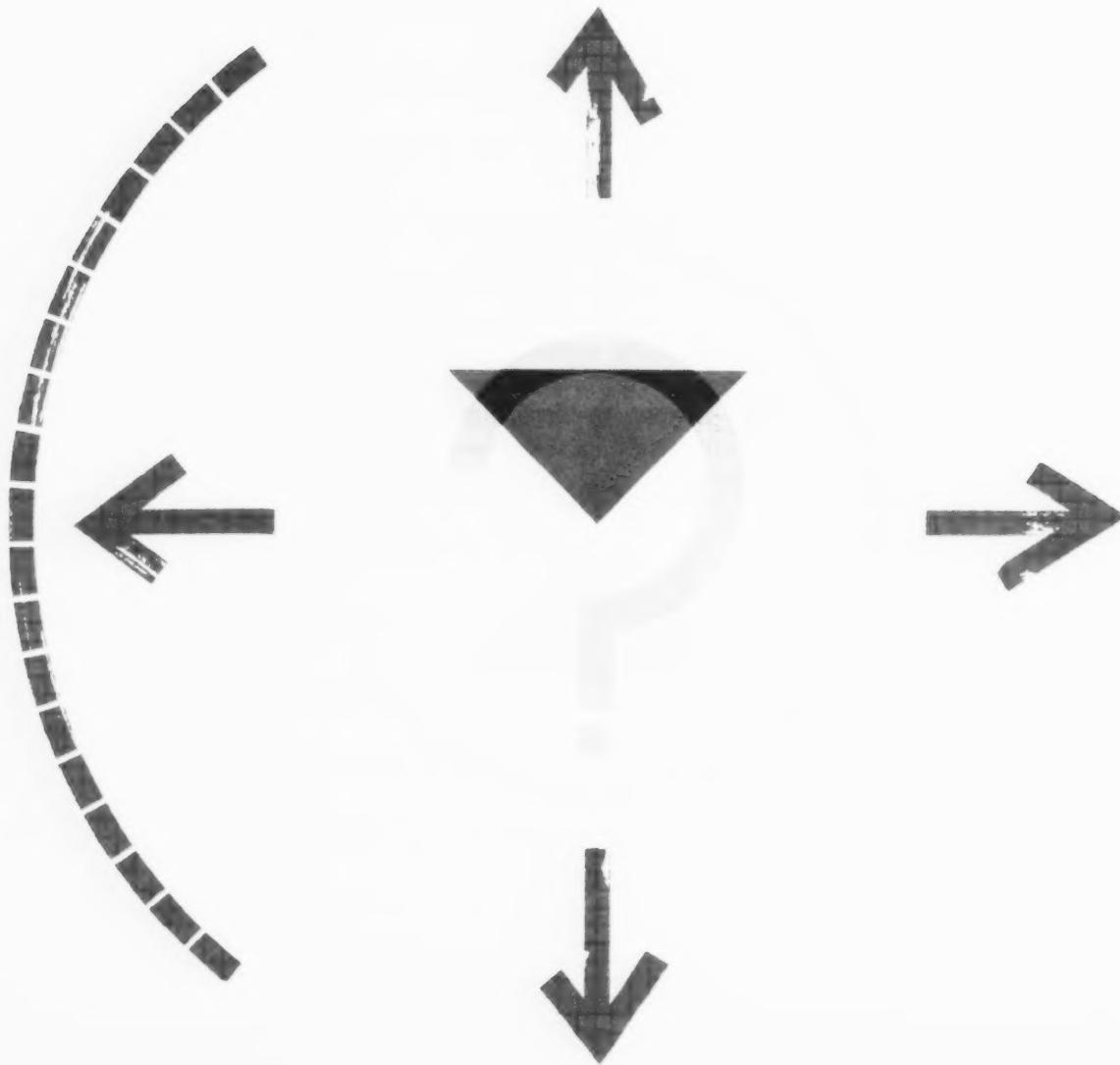
The management consulting service has grown at a rapid pace within the past 25 years to where there are now over 1,800 firms with over \$400 million dollars in billings a year. Consultants can contribute valuable and tangible benefits to their clients. Some are engaged on a retainer basis while others perform on an "as required" basis.

A consultant, with his outside and objective viewpoint, is able to clearly evaluate a given situation in a company and render a decision without being influenced by company politics. Also, consultants can give undivided attention to a problem which the company executive cannot do because of his many diverting duties and responsibilities. Good consulting helps management help itself.

On the Threshold

Within the next decade, data processing will have many new tools and techniques at its disposal. Micro-miniaturization will enable packaging of the most powerful data processing systems into startlingly small spaces. The reliability of components will be almost 100%. Scheduled preventive maintenance will be the only down time incurred. Access times, arithmetic functions and input and output speeds will stagger the imagination of today's sophisticates. Systems design, programming aides and other techniques will cut testing, debugging and actual processing times which are now so much a hindrance to **operational use of data processing equipment.**

Along with these developments, solutions to the ever present problems of good management, audit checks and control must also be provided. The awareness of management was never in more need of application than in data processing.



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RCA INTRODUCES TWO NEW DATA PROCESSING SYSTEMS

John L. Burns, RCA President, Uses 13-City Closed-Circuit TV Network to Announce New Systems.



INSTANT ADDING — All the 183,000 multi-digit figures in those yards of adding machine tape can be added in exactly one second by the new RCA 601, said to be the world's fastest electronic data processing system. At the system's introduction, John E. Johnson, Vice President, Marketing, for the Radio Corporation of America's Electronic Data Processing Division, said another of the system's "quick tricks" is its ability to recall any fact or figure from its memory units in 1½ millionths of a second. Behind Mr. Johnson is a 601 processing cabinet.

WITH THE INTRODUCTION on April 13 of two new electronic data processing systems, one described as the world's fastest business computer, the Radio Corporation of America lay claim to being the first company to offer a complete range of electronic computer service, basic and peripheral equipment, for all types of business, big and small.

Announcement of the two new systems — the RCA 301 and 601 — was made by John L. Burns, President of RCA, over a closed-circuit television network reaching some 3,000 representatives of business and industry in thirteen cities across the nation. The cities were New York, Chicago, San Francisco, Boston, Philadelphia, Washington, Pittsburgh, Cleveland, Atlanta, Detroit, Dallas, Los Angeles and Minneapolis.

Introduction of the two new systems, Mr. Burns pointed out, "takes the wraps off the first total

concept of computer service." Joining forces with the RCA 501, already in service in many places and in the New York financial district, the 301 and 601 will provide all-transistorized computer service for companies ranging from small firms with as few as 300 employees to the biggest corporations, Mr. Burns said.

"Our ascendancy in the field has been rapid," Mr. Burns said, "and we expect to augment our growth in EDP so that within the next decade the volume of our data processing business will equal that of RCA's total business today."

Mr. Burns said that orders already have been received for thirty-five RCA 301 systems and lease arrangements concluded with the Southern Bell

(continued on next page)

"FIRST ON RECORD" — Magnetic memory discs of the new RCA 301 Electronic Data Processing System, designed to provide full-scale data processing for small firms, are examined by two Radio Corporation of America executives at the system's introduction. This is the first data processing system to use magnetic discs — similar to 45 rpm records — for its "memory storehouse." It also can use magnetic tape on reels. The discs are said to provide new convenience in the handling and storage of information. (Left to right) T. A. Smith, Executive Vice President, RCA Industrial Electronic Products, and Donald H. Kunsman, Vice President and General Manager, Electronic Data Processing Division.

Telephone Company and the New Jersey Bell Telephone Company for the RCA 601 systems.

Explaining the significance of RCA's new range of systems, Mr. Burns said:

"These new systems bring the electronic handling of paperwork to a point of development and usefulness that was unheard of only a few years ago.

"Their high speeds and versatility will give new impetus to the growth of the data processing industry, now well advanced, and hasten the day when the computer will take over the dull, repetitive clerical chores in thousands of business firms, large and small.

"The RCA 601 offers more work power than any data processing system now available," Mr. Burns explained. "For example, in a second's time, it can make up to 666,667 'decisions', or it can add 183,000 eleven digit figures.

301 Service for Small Firms

The compact 301 system, he said, is designed to provide full-scale data processing for small firms. It is the first system to use magnetic discs, similar to 45 r.p.m. records, for its "memory storehouse." It also can use magnetic tape on reels.

"In less than fifteen months after announcing the 501, our first all-transistor computer," Mr. Burns commented, "RCA has installed more than 50 per cent of the transistorized systems now in use.

The two new systems, he added, will be integrated into the network of RCA Electronic Systems Centers, now equipped with the 501, being established in major cities. Centers are operating at 45 Wall Street, New York, and at Cherry Hill, N. J., near Philadelphia. A third center is being installed in Washington, D. C., and others are planned later this year at Midwest and West Coast locations.

"World's Fastest" Business Computer

Mr. Smith, describing the operation of the 601 system, cited as an example of its speed the fact that it would be capable of recalling a fact or figure from its memory equipment in only 1.5 millionths of a second.

"With a multiple printer hookup," he said, "this equipment can turn out paper work at a rate fast enough to print a full-length novel in one minute—7,200 lines of 120 letters each."

The system's advanced modular design, he said, "provides protection against computer obsolescence." Great variety and volume of work can be obtained by "plugging in" additional modules of equipment. The system can be built up to handle 20 programs at one time, he added.

Another advantage of the modular design, Mr. Smith said, was to make the 601's programming compatible with that of any other data processing equipment. As an example, he said, its instruction control units can take instructions from any kind of unit and then feed the information directly to the 601. Rental fees for use of the 601 will begin above \$20,000 per month.

RCA 301 Like "Compact Car"

Mr. Smith likened the RCA 301 system to the "compact car" in its ability to provide full power, with maximum economy and simplicity of operation. Its rental will range up to \$9,000 per month.

"Using the 301 system," he pointed out, "the small businessman can compete with large companies in providing the extra services, economies and efficiencies that data processing affords.

"The 301 can serve as a complete data processing system or as an auxiliary to the larger 501 and 601 systems. In the latter capacity, it can be used as a tape-to-card converter, off-line high speed printer, or paper tape to magnetic tape converter."

The 301's memory hookup, he added, can include five "juke box" disc file units, each holding five million characters, and up to twelve tape stations, each holding four million characters. Discs provide the equipment user with new convenience in handling and storage, Mr. Smith said, and like magnetic tapes they can be erased and used many times.



For information on the 301 Circle No. 34 on Reader Service Card.

For information on the 601 Circle No. 35 on Reader Service Card.

BEEMAK TAB CARD HOLDERS

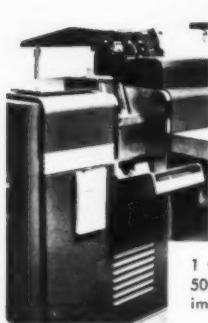


BP-100 CARD HOLDER

Can be attached to products, conveyor belts, bins, boxes, shelving, to implement production control, inventory control, invoicing and other punched card systems. Beemak Holders have withstood hard usage for eight years and are made in ivory, red, green, blue, yellow and black for color coding if desirable. Keeping correct tab cards at the source of record data provides better controls and faster handling of all types of merchandise.

BP-130 MAGNET HOLDER

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Circle No. 3 on Reader Service Card.



-A Monthly Feature Dreyfack on PERSONNEL

RAYMOND DREYFACK

IT'S THE CLOSE of the fourth quarter. The home team is behind 7-6 and has the ball on the 40-yard line. Fifty seconds remain in the game. The quarterback is shunted the ball by the center. He moves back two steps and lifts his arm to pass, eyes desperately seeking a receiver. He sees his chance; a man has broken loose in the end zone. Just as the opposition piles in on him he gets away the ball. His aim is accurate, his receiver sure. The goal is scored. The game is won.

Well, you're probably saying, hurrah for us—but what does all this have to do with systems and data processing? Not a thing, directly, but it will serve to draw a parallel. Let's first define our problem. We have a passer, a receiver and a football. The objective is to win the game.

Now for our parallel. Let's assume our passer is a systems analyst, the receiver is a data processing manager, our objective is smoother, economical, accurate data handling—and the football—if you'll pardon the expression, that old bugaboo, paperwork.

Just as the passer, receiver, pigskin and goal in a football game must be closely coordinated for effective results, so must our four vital elements of data processing be coordinated: the analyst, data processing manager, paperwork flow and business objectives. Teamwork applies just as strongly in the office as it does in the stadium or ball park.

Each member of the team is assigned his special function to fulfill. The systems analyst and data processing manager must complement one another as loyal team members if optimum processing benefits are to be forthcoming.

Dangers of Over-Specialization

We're living in an age of intense specialization. It can sometimes be

dangerous to over-specialize. The data processing man with his nose constantly buried in a plugboard panel won't get much of an opportunity to sniff what's going on outside his own little realm. By the same token the analyst who thinks too broadly in terms of the "overall" and "long range" requirements, without bothering to interest himself in the personnel and production problems of the data processing department, will be correspondingly limited by his narrow approach.

The ideal data processing manager is part systems analyst, and conversely, the ideal systems analyst is part data processing manager. Duties and responsibilities in these two fields must inevitably overlap.

Plugboard wiring, for example, can't always be rigidly defined as the function of either one or the other. Planning and forms design—always vital responsibilities in any business—should also, to some extent, be shared by systems and data processing departments. In all of these overlapping areas it's not so much a question of narrowly restricting scopes, but rather one of emphasis and direction.

It's the data processing manager's job to get out documents and reports accurately and on schedule. But how often can the simple act of a systems man's revising a procedural flow, or revamping a form, help eliminate a bottleneck in this area? How often too, will the analyst, having conceived and outlined his plan, benefit immeasurably from a frank and open discussion with the man who will be charged with the responsibility of putting his ideas into effect?

When the analyst and data processing manager see fit to complement one another as a team they will look good as a team, and individually as well. Where conflict and competition exist, as they sometimes

seem to between these two factions, disharmony will be proportionate to the amount of disagreement and self-imposed insecurity of the participants. The only one then who will "look good" is top management. They'll look good for the source of the disagreement, and at that point heads will either work together or fly.

Expand Areas of Cooperation

Broadly speaking, it's the job of the systems analyst to look beyond the data processing room for his inspiration and ideas. His function should be one of integration and coordination. He must follow a piece of paper from the production department, for example, to the warehouse; from the warehouse to the shipping floor; from the shipping floor to the data processing department; from there to the inventory department, etc. If something is being done by one department that is repeated by another it's primarily his problem to uncover the duplication.

Is something being done manually that will lend itself more readily and economically to mechanization? Is the chain of forms comprising the paperwork linkage between business functions right from a design and work flow viewpoint? Why is this being done? Why that? How can it be done faster, more efficiently, more economically?

How and why. These are the passwords to the systems man's heaven. But when did it ever hurt the data processing manager to ask such questions?

People, production, machines. How closely must the data processing man work with all three? He has to get out reports, process transactions, know and schedule the operation of his machines. He has to work with people, understand them, gain their

(continued on page 47)

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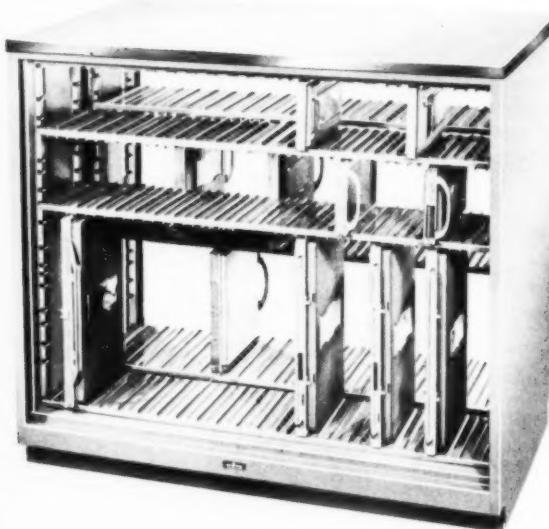


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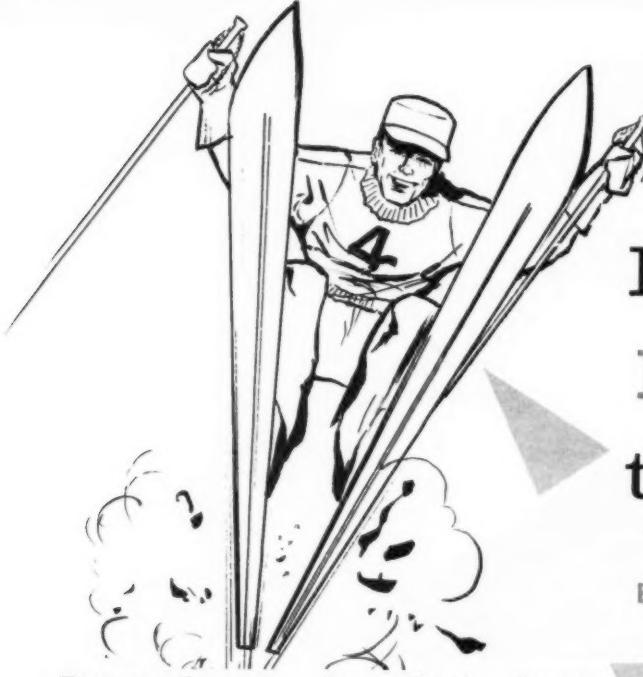
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SQUAW VALLEY, CALIFORNIA

How RAMAC Scored the Olympics

Exclusive to DATA PROCESSING Magazine

PROBABLY the most random application of random-access computing yet devised was worked out for the scoring and information support of the 1960 Winter Olympics in Squaw Valley, California, in February.

In the world of data processing, Olympic scoring represents a great demand on the random access capabilities of a computer. The results of every competitive performance in each of twenty-six Olympic events were punched into cards and fed into the computer. In an in-line operation, all programming, processing, calculation, sorting and output of data was done on a random access basis.

In effect, it is as though a business had twenty-six separate jobs on a single data processing machine, which handled all of them simultaneously as new information on each was entered item by item. Essentially, this is what the Squaw Valley installation, a Dual System of IBM RAMAC 305 machines did. At the same time, it created worldwide recognition of computer capabilities in terms the general public could understand.

The scoring of Olympic events is highly complex in itself. Each competition has its own scoring rules and procedures. The most involved of these is figure skating. Each time a skater performs, nine separate judges enter ratings for the degree of proficiency. The ratings must be multiplied in turn by a factor representing the degree of difficulty for the individual figure performed. And each skater is rated on six different performance units.

Comprehensive Program

After the RAMAC tallied scores by all judges for some forty skaters, the computer proceeded with a series of calculations to determine the winner and the relative ranking of all competitors. In

doing this, the complete performance statistics for each competitor were passed through seventy-nine separate sorting routines. All told, there were some 2,000 separate steps in the figure skating program alone, and these steps were only a portion of the comprehensive program written for the RAMAC 305.

In previous years, Olympic results had been computed manually by highly dedicated committees of voluntary officials. Working continuously, they finished computations for events completed in mid-afternoon in time for an announcement of results by that evening. Complete results for the 1960 Winter Olympics were posted for most events within two or three minutes after the last competitor had performed. For the hardest-to-score figure-skating event, less than sixteen minutes was required.

(continued on next page)

The Olympic Data Processing Center with IBM equipment installed, was a new addition to the 1960 Winter Games to make the scoring of events the fastest in history. Connected by telephone and teletype to every Olympic event area, it enabled the officials, press, radio and television facilities to know the winners of most events in less than two minutes — where scores took hours to compute in past Olympics.



At the close of a series of Olympic Games, official results are published in a bound volume known as a Protocol. The job of drawing up and publishing a complete Protocol formerly took about six weeks. With the RAMAC system and its supporting equipment, a complete Protocol was published and delivered approximately three hours after the close of competition.

Performance of the computing center in Squaw Valley has, unquestionably, gone a long way toward sharpening the focus on data processing. Olympic fans, judges and competitors are drawn from a broad cross-section of international life—on both sides of the Iron Curtain. In some parts of Europe, the Winter Olympics commands the same kind of interest as the World Series does in America. Many millions of people have seen dramatic illustrations, with examples which are within their own immediate areas of interest, of just how valuable and beneficial data processing can be.

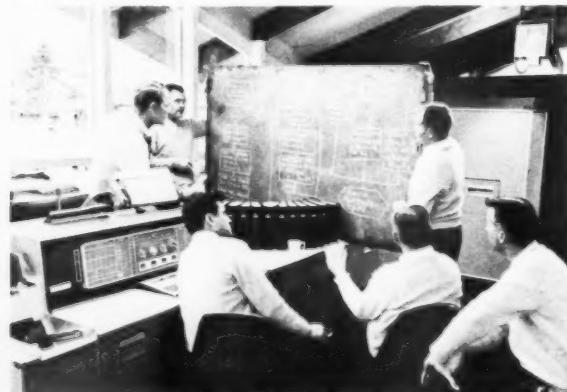
A Typical Example—Men's Downhill Skiing

As part of the registration procedure, information was entered on a punched card for each competitor entered in every event. Thus, if a man was competing in three different events, the registration procedure produced three separate cards for data processing input. To illustrate, a Master Card was created for each registrant for the men's downhill events and fed into the system. There was a separate section of the disk memory set aside to accumulate data for this event, as there was for every other Olympic Competition.

In addition to setting up for scoring operations, the system also began, at this time, to accumulate current background information about each downhill competitor. This was specifically for the use of the press covering the Olympics.

For every competitor, the public relations groups within the Olympic Organizing Committee prepared and printed advance biographies which were

IBM operating personnel of the Olympic Data Processing Center conduct a periodic review of the complex procedures necessary to score the 60-meter ski jumping and other events.



Volumes of detailed programming and scoring procedures for the 26 Winter Olympic events which were automatically scored by the IBM RAMAC 305 computing system, were the "working library" in the Data Center.

distributed to the press on request. Additional data concerning each individual was kept current from the moment he arrived at Squaw Valley.

The public relations department of the Olympic Organizing Committee had established a twenty-five man staff of voluntary reporters. These people maintained continuing liaison with the various race committees and monitored all activities in the competitive areas. For example, the system's current information file contained a man's name, the date he arrived at Squaw Valley, and the events in which he had entered. Thus, if he had been clocked on a trial downhill run two days later, the time or any other information was written up by a reporter and fed into the system. If a competitor, for example, had sprained his ankle, the RAMAC input information noted this fact, indicated which doctor he had visited and noted the prognosis. When he had returned to active practice, this also was noted.

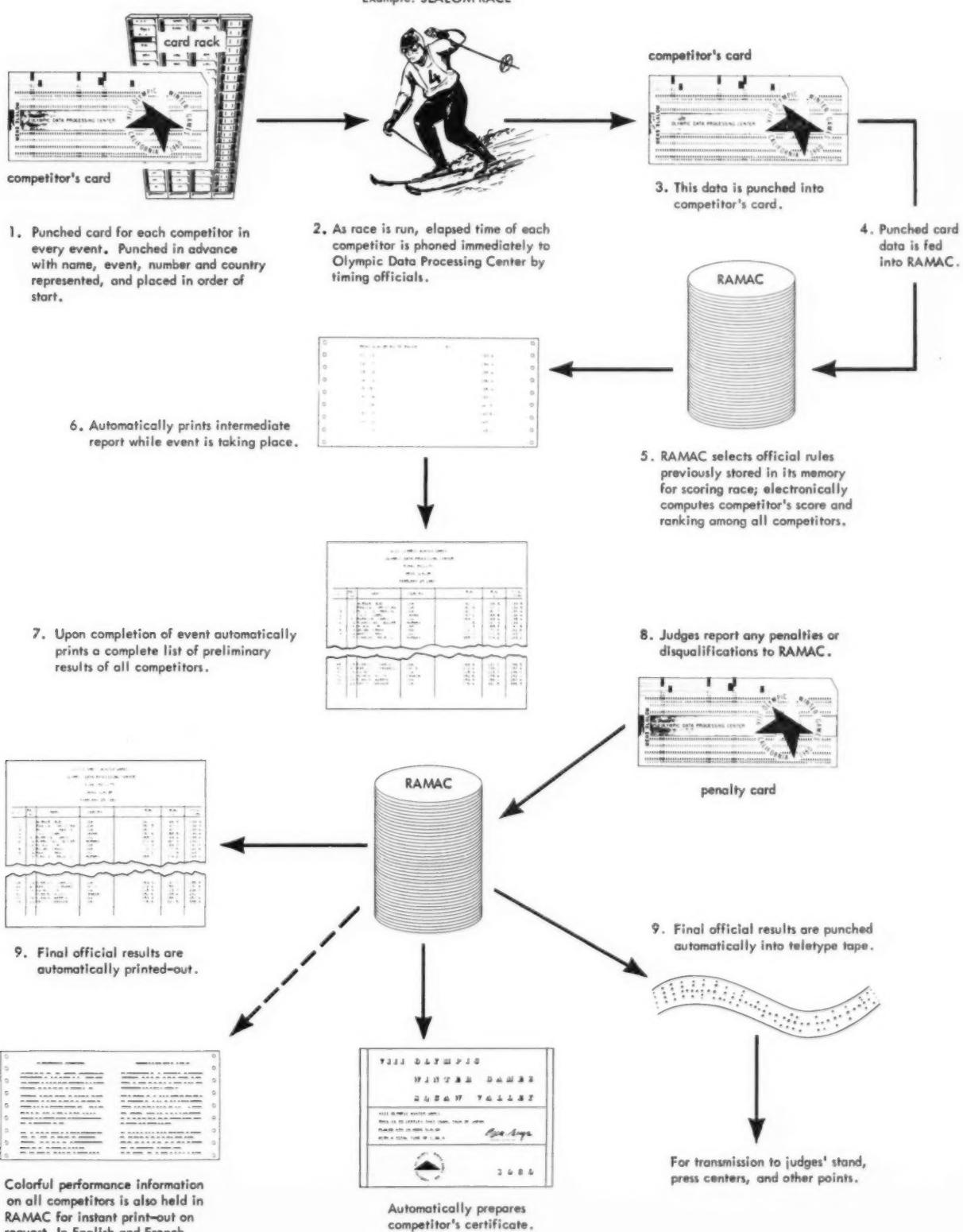
All of this data was collected in the RAMAC memory in both English and French. Any news reporter covering the Olympics could call for this information at any time. He could have specified whether he wanted to pick it up at the data processing center or whether he wanted it sent, via teletype, to either the Olympic press headquarters or to other press centers at nearby Lake Tahoe or Reno. The reporter could also specify whether he wanted the information in English or French. The RAMAC provided output either by an on-line IBM 407 Accounting Machine or five-channel punched paper tape which was fed immediately into a teletype transmitter.

Electronic data processing, through the scoring and information applications at Squaw Valley, has made some important break-throughs in the eyes of the whole world.



How the IBM RAMAC 305 Computed Scores of the 1960 Olympic Winter Games

Example: SLALOM RACE





JOSEPH R. DE PARIS

Data Processing Input

EVERY BUSINESS TRANSACTION starts with a recording of the facts on a piece of paper. This origination of the data is often manual and in a form not compatible with machine processing. Therefore, in order to process data by machine methods, it is necessary to convert the data on the source document into a code and a form to which the machines being used are responsive.

Hence a two step process is involved in originating the data for a business transaction: first, the manual recording on the source document; and second, the conversion of the data to machine sensible form and code. In an integrated system this two step process is reduced to one step by punching a paper tape at the time the original document is created on a machine such as a Friden Flexowriter. The punched paper tape then is used to perpetuate the data automatically at every point in the system where it is required without the need for additional manual transcription.

Certain procedures, such as sales order routines, have proved to be susceptible to integrated data processing techniques. Other procedures, such as timekeeping and production recording, have been more stubborn. The recording of manufacturing control, accounting, and payroll data is still a two step process. The factory people write the facts by hand on a source document; the office people punch cards with the same facts for machine processing.

The importance of this segment of data processing has not been lost on data processors or office equipment manufacturers. Communication of data from the factory to the office and its subsequent conversion for machine accounting has always been costly in terms of time and personnel. Too much time is lost between the time an operation is started in the factory and its status is reported

by the office. Corrective action may be delayed, sometimes at great cost. Personnel required to punch, verify, and reconcile factory data may be excessive.

Systems Developed to Transmit Data

Office equipment manufacturers, ever alert to the needs of industry, have been quietly engaged in research designed to develop equipment to automate the origination of factory to office data. They have evidently engaged in a massive attack on the problem. In the last 12 to 18 months a number of systems have been announced which effectively provide for automatic transmission of time and production information from the source of operation to a central processing area. Information is transmitted in machine-sensible form — punched card or tape. Moreover, it is transmitted in real time, i.e. as each operation or transaction takes place. Paperwork and clerical operations are eliminated in the factory; keypunching and verifying are eliminated in the office. Consequently there is no build-up of a work backlog and early reporting of the status of manufacturing activities can be realized.

357 Data Collection System

IBM has announced the 357 Data Collection System, Friden has introduced a system under the name of "Collectadata," Stromberg Division of General Time already has pilot installations of its Transacter System. G. E. has an Industrial Data Accumulator (IDA), Standard Register has a system using Stanomatic, American Electronics has the PDP Data Integrator.

Let's look at some of these systems to see how they function. IBM's 357 Data Collection System has input stations on location in factory areas where data is generated. Up

to 20 of these input stations may be connected via cable to an output station in a central processing unit. The input stations read punched cards containing production data and transmit their data to the output station which is an IBM Card Punch. A punched card is created at the output station making immediately available the facts about a manufacturing operation.

In a typical application production workers will send information to a central data collection center by means of transaction cards. A "man" card may give department and employee number, shift, and rate; a "job" card may show job number, part number, and account. Variable data such as quantity, operation, and machine number may be keyed on the Storage Keyboard. Time of the transaction may be included if a clock unit is added.

Collectadata

Friden's "Collectadata" also is a system of readers and punches, designed to collect data at the source and channel it to a central processing unit. The readers can be designed to accept data from punched paper tape, edge punched cards, punched cards, or form cards. As production orders are processed through the manufacturing steps, the input form is inserted in a Collectadata transmitter providing fixed facts about the transaction such as man, job, account. Variable numeric data such as quantity may be entered by manual dials. This variable and fixed data is then transmitted to the receiver in the central processing unit where the information is reproduced on punched paper tape. The tape then can be fed to a tape-to-card converter, a Flexowriter, or a computer for automatic, immediate compilation of information.

(continued on next page)

Transacter

Stromberg's Transacter System is already at work in a government installation. Stromberg's contribution consists of a number of strategically placed transmitters called Transacters tied by cable to a receiving unit in central processing called a Compiler.

In a typical system a number of Transacters may be located at remote reporting points. Each Transacter can accept for a transaction up to three tags, tickets, or prepunched cards containing identifying data such as job, employee number, work order, machine. In addition to this repetitive data, variable data (*number of units or minutes*) may be entered via dial settings. To complete and control a transmission, entry is made of a transaction code, location number, and pertinent programming instructions.

All information is then transmitted to the Compiler, which is the central receiving-recording device. The Compiler adds to the message received information like shift, date, and end-of-message code. Messages are recorded on 5, 6, 7, or 8 unit code punched paper tape. The tape is compatible with and can be used to actuate data processing systems, communications systems, or tape-to-card converters.

Stanomatic Shop Recorder

Standard Register offers the Stanomatic Shop Recorder System. This one differs from the previous systems in its method of collecting data and in the fact that transmission is not on a real time basis, but on a periodic batch basis. Stanomatic operates on the basis of a native language dot code which it reads from properly encoded documents and which it converts at high speed to virtually any of the usual machine codes — punched card, magnetic tape or paper tape.

The Stanomatic system consists of Shop Recorders distributed throughout the plant for recording of transactions, and a Stanomatic Reader-Translator which converts data from code spots on paper to whatever form of input record is needed.

In this system each man has a plate with his number embossed in both arabic and Stanomatic dot code.

Each operation has an embossed plate with identifying arabic and dot codes. Each work order has its identity punched in an IBM card in regular IBM code.

To record a transaction an employee inserts his "man" tag into the Shop Recorder, together with the operation tag and work order card. Variable data is keyed in on the keyboard. Time is recorded by the built-in clock. The transaction is printed in regular language and in Stanomatic code on continuous forms stored in the recorder. Periodically packs of these encoded forms are removed and passed through the Reader-Translator which converts the data to the input form desired or direct feeds high speed printers or computer systems.

In all the systems described, if you will note the completeness of the transmitted data, the real-time receipt of it in data processing, the fact that it is received in a form ready for machine processing, you will realize the impact of these new management tools. Add to this the vast reduction in paperwork creation and flow; recognize the improved accuracy inherent in these systems due to the permanence of fixed data in tags or cards; and you will realize that once again American ingenuity has triumphed over a problem of data processing.

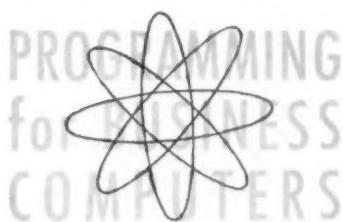


Running Mates on the Same Ticket (continued from page 41)

confidence, assist in their training, inspire cooperation and support. And when did the understanding and appreciation of these elements ever hamper the systems analyst? How would he ever function well without them?

Specialization is a wonderful virtue. It's further enhanced when carried a step further. Why not specialize in team work and cooperation? In human understanding and appreciation of the other guy's problems? It's so much more pleasant to work under harmonious conditions. And it will lead to a sure touchdown. ■

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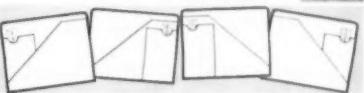
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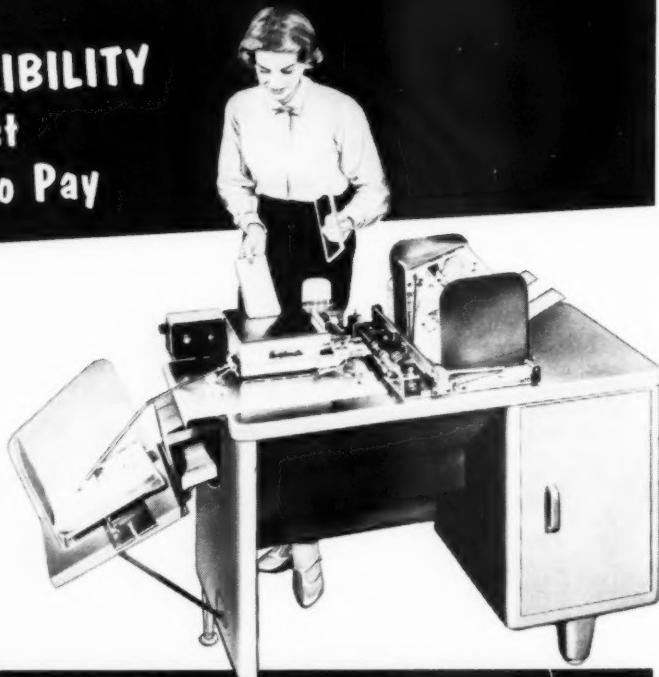
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The Scriptomatic Addressing and Data Writing System represents the "perfect marriage" of punched card records and addressing equipment. The Model 10-S simply reads the notched edges of any card and prints from it or skips it according to program. Masters are made easily by any typist and electric typewriter in a fraction of the time required to make stencils or plates. Dollar savings are as drastic as the cost of paper versus metal, with extra bonuses in lower labor requirements and up to 75% less filing space.

Some Scriptomatic users have saved enough to pay for the system installation in the first year. Naturally, they are "heroes" in their companies and you can be, too! Write today to Scriptomatic, Inc., 1109 Vine Street, Philadelphia 7, Pa., for detailed literature and the name of your nearest Scriptomatic representative. Chances are, we have some specific Scriptomatic case histories in your field.

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RAY MARIEN

- A Monthly Feature

Marien on FORMS

Who Is the Real Paperwork Emperor?

IF WE ARE TO REALIZE any substantial profit from business operations, it is essential that the paperwork be controlled first. It cannot be allowed to mount to such unreasonable proportions that it negates our production skills.

That is why most companies attack this problem at its *source* by attempting a formal program of forms control.

If such an installation is *properly* established and adequately maintained, it furnishes the nucleus for procedure studies, work measurement, form elimination and consolidation, and dollar savings in printing costs.

If it is *poorly* planned and conducted by unskilled personnel, the result is only increased waste. Unfortunately, there are *many* programs in this latter category. Some companies spend large amounts of money for forms programs and end up with paperwork bottlenecks staffed by "requisition shufflers." Experiences such as these can sour management on the merits of forms control. However, it is not the *concept* of forms control that is wrong, it is the individual *program* that is at fault. More specifically, it is the "*expert*" who put the thing into operation.

In the many seminars I've conducted and among the numerous groups I've addressed on the subject, one fact has impressed me forcefully, in a *negative* fashion. There are only a handful of companies, regardless of size, that have really professional forms programs! The rest range from *mediocre* to *miserable*!

Detriment of "Control-Less" Forms Control

Among the poorer attempts at forms control we have seen, there were many crackpot notions which

had been put into effect. Perhaps the silliest of these is "*control-less*" forms control. Here, the functional file is so simple as to be virtually useless. Reorders are never questioned and re-stocking requisitions are ignored. Once a form has been designed, it's forgotten. The assumption is that it can't be improved. The attitude is, let purchasing take it from here on! That idea has a kernel of merit, but when forms control never sees that form again and keeps no notes on it regarding potential changes, where is the *control*?

This ridiculous type of operation also allows most departments to make up their own forms. The fallacy of this is so apparent it hurts. The "*thought*" is that more money can be saved by controlling "*scotch*" tape or typewriter ribbons. We recall one company that permitted its sales department to design and order their own sales order forms. The next time around, forms control took over and on *one* order alone, saved them \$5,000! Imagine what the waste would be if *every* department ordered their own forms without channelling them through a skilled forms analyst! (*How many typewriter ribbons can you buy for \$5,000?*)

Some misguided people believe *anyone* can set up a forms program. They say "*give it to a systems man*" or an "*accounting clerk*" to handle. That's more nonsense! What in the world do those people know about forms analysis, or printing and paper specifications? Would you have a garage mechanic put a filling in your tooth? Or let your eight-year-old daughter remove your appendix? Of course not! You need a professional to do a professional job! And a good forms analyst can save his company hundreds of thousands of dollars. To get one, you *may* have to

go outside. Where else can you find him? On the assembly line, or posting to the general ledger? Of course not! If he is a top-notch forms man, what is he doing *there*?

The do-it-yourself fanatics of the "*control-less*" school would have everyone design his own forms. They would pass out instruction booklets on the subject to *all*. That's about as idiotic as putting a pile of money in the middle of the floor and having the employees draw their own pay from it!

The silliest thing about all these half-baked ideas is that they are seriously put forth by people who "*somehow*" have acquired reputations as forms control experts. Actually, they deserve that designation about as much as a *quack* deserves to be called "*doctor*!"

Forms control, in the hands of "*pros*" does not create paperwork empires—it whittles them down. Often, because the forms analysts' achievements are in the readily visible realm of dollar savings, they may be much more acceptable to management than other efficiency experts whose effectiveness can only be measured in vague terms. Many bosses are wise to theoretical savings of space and man hours. If they don't see the added dollars in the company's bank balance, they laugh off the "*expert's*" claims of accomplishment.

In many cases, the same people who are so proud of systems "*achievements*" which can't be measured in hard cash, are the first to point the finger at "*empire-building*" forms men.

We leave it to you. Who is really the empire builder? The man who *produces* and saves *money* for his company, or the man who talks a good game but does *nothing* tangible? ■

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"Project CLIP—The Design of a Compiler and Language for Information Processing," a paper by Harvey Bratman of SDC's Data Processing Research staff, is available upon request. Send request to Mr. Bratman at SDC.



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Circle No. 16 on Reader Service Card.

Product Reports



HONEYWELL 400

Although the 400 embodies many of the features of the Honeywell 800, it is on the whole a less sophisticated machine intended for the less sophisticated applications and supplied at a less sophisticated price. The 400 is not a successor to the Honeywell 800. Although deliveries of the Honeywell 400 will not commence until the summer of 1961, these two machines will be on the market at the same time, selling independently, on their own merits.

The design of the Honeywell 400 has been specified to ensure an efficient correspondence between the 400 and the 800. This high efficiency of correspondence is obtained by having the two machines use a common language for both programs and data and by having them use the same magnetic tape units, the same high-speed printer and the same punched card readers and punches.

Although not as powerful as the Honeywell 800, the Honeywell 400 is, nevertheless, a complete system. In standard form, the system will look like this:

The Central Processor, similar in construction to the Honeywell 800—but smaller, contains a memory of 1,024 words. Like the Honeywell 800, the 400 operates with 48-bit words and so for comparative purposes may be thought of as providing storage for 10,000 characters.

At customer option, the memory may be expanded to twice the stand-

ard size. That is, up to 2,048 words, or 20,000 characters when expressed that way.

Like the Honeywell 800, the 400 is programmed with 3-address instructions. This is important not only on its own merits, but, being a specification of both the Honeywell 800 and 400, it facilitates the employment of common programs.

The internal speed of the Honeywell 400 is approximately 6,000 of these 3-address instructions per second. The 800, however, is built to exploit the economic advantages of automatic parallel-processing, while the 400 is built for situations where the volume of work is insufficient to load an 800. However, it is recognized that rapid sorting of data is always important and for this reason the Honeywell 400 provides the facility of simultaneously reading from one magnetic tape and writing on another magnetic tape.

In addition to the memory, the arithmetic unit and the control unit, the central processor contains the control circuits for a printer, a card reader, a card punch and up to six magnetic tape units.

Printer

The new high-speed printer is the same 900-lines-per-minute printer as the one supplied with the Honeywell 800. This printer uses the well-tried spinning drum principle and is noteworthy, among other things, for its robust construction.

The output consists of lines of print 160 character positions long. Up to 120 positions may be printed in any one line. 900 lines of print are generated every minute and up to five carbon copies may be obtained.

The alphabet consists of 56 characters.

Line feed is under program control and normal spacing is 6 lines per inch. Lines may be skipped at the rate of 126 lines per second.

A print storage unit is available at customer option. With this unit added, the 400 will operate the printer and perform other operations at the same time.

The card reader operates at 650 cards per minute. The card punch is provided in two versions operating at 100 cards per minute and 250 cards per minute respectively. The customer has the option of specifying either of these punches.

All the punched card equipment consists of machines well-known in the industry and used in other systems besides the Honeywell 800 and 400.

Magnetic Tape Units

The Honeywell computer magnetic tape units differ in a number of important respects from other tape units.

With its transfer rate of 96,000 decimal digits per second, it is said to be the fastest available with a commercial data processor.

Prototypes have been in operation for a year. The Honeywell computer tape mechanisms differ principally in the method used to clutch the tape and transport it under the magnetic head and to seize the tape when it has to be stopped. Commonly, the tape is moved by using a mechanical roller to pinch the tape against a spinning capstan. The tape then is stopped by releasing the roller pressure and trapping the tape between brake blocks of some kind. In the Honeywell design, air pressure and vacuum take the place of the pinch rollers and brake blocks. The visible effect of this is to eliminate a great many moving parts and the attendant problems of wear.

Orthotronic Control

Internal transfers of data are

checked by parity methods and magnetic tape transfers are looked after by Orthotronic Control which detects and corrects errors occurring either during recording on tape or during playback from tape.

The price of the standard Honeywell 400 system, including the card reader, four magnetic tape units and the high-speed printer is \$8,660 per month.

Circle No. 32 on Reader Service Card.

ROYAL PRECISION 9000 COMPUTER SYSTEM

A new, modular electronic data processing system which is "application-engineered" for the complete range of data processing needs was introduced by Royal Precision Corporation, Port Chester, N. Y. Philip M. Zenner, President of Royal McBee Corporation, which will market the new RPC-9000 computer, said that data can be accepted in random order, and all affected records are automatically up-dated in a single uninterrupted sequence of operations.

The RPC-9000 is fully designed to handle the complete range of business data processing needs, such as payroll, inventory control, production control, accounts receivable and payable, sales analysis, and forecasting.

Information can be entered into the computer from punched paper tape, punched cards, or through the typewriter keyboard. The range of 43 "commands" available provides a high degree of programming flexibility.

Basic System

The basic system includes a central processing and control unit which operates in microseconds, performs the calculations, controls the program, and searches the external memory tape; a continuous magnetic tape file for data storage; and an input-output tape typewriter system

that reads paper tape at 60 characters per second, and punches tape at 30 characters per second.

Optional Units

Optional high-speed input-output units also available include a 400 cards-per-minute photoelectric reader for rapid input of data contained in 80-column punched cards; a 500 characters-per-second bi-directional photoelectric paper tape reader; a 300 characters-per-second tape perforating unit; a 150 lines (*of 120 alpha-numeric characters each*) per minute printer; a high-speed 666 or 1,000 lines (*of 120 alpha-numeric characters each*) per minute printer; additional tape typewriter systems for on-line or off-line use, and additional paper tape punch/read on-line units.

Memory

Internal operating memory consists of nine blocks of magneto-strictive delay lines capable of storing 432 instructions or 72 twelve-character words of data. This may be expanded to approximately 2,000 internally stored instructions, or 328 words. Memory units are compact, simple and easily replaced.

The external data memory is contained on continuous loops of magnetic tape. Each tape loop will store up to 1,000,000 alpha-numerical characters. Separately stored cartridges of tape expand memory capacity.

Cross-communications between input units, computer and output units is by separate buffers which speed up the overall computer operation, and allow multiple input, multiple search and multiple output operations. Eight separate records may be searched simultaneously. Up to 30 input and output units may be operated simultaneously "on-line."

The basic system requires only 150 square feet of floor space, with little or no site preparation, no air conditioning, and is operated by ordinary

house current. The entire system is protected from power failure by a built-in "on-line" emergency power supply.

The RPC-9000 is available on lease, lease with option to purchase, or purchase. The basic system is priced at \$120,000, or may be leased for \$2,450 a month.

Circle No. 30 on Reader Service Card.

BENDIX G-20

The Bendix G-20, general purpose, automatic data processing system represents a new achievement in computing machinery design. Completely modular, the system can be expanded in size, or the nature of its operation changed, when desired. Of high processing speed, the system couples a fast central processor with terminal equipment that can operate concurrently with, and independently of, the central processor. Functionally efficient, the system may include low cost control buffers which free the central processor from routine data-handling operations. Versatile in application, the system can also include card and printer couplers, control consoles, magnetic tape units, punched card equipment, paper tape equipment, and high speed printers.

A wide variety of systems with widely different characteristics can be assembled from these common elements. Information can pass from one element to another without passing through the central processor enroute. The units can be connected together in such a manner that desired elements operate simultaneously.

The Computer

The G-20 computer is the central processor of the Bendix processing system. The processor is built of solid state components, and includes a random access, expandable, magnetic core memory.

Memory

The internal memory consists of from one to eight magnetic core modules of 4096 words each. Two memory modules can be located in the G-20 cabinet. Additional modules are held in adjacent matching cabinets. Each word in the eight modules is directly addressable.

(continued on next page)

The seven additional memory modules can be selected from two types. The basic type of module acts as a direct extension of the internal memory. The other type, called a communication module, acts as a memory extension and also provides facilities for direct input and output of external information. The number of direct input-output paths to the central processor, capable of simultaneous operation, is one greater than the number of communication modules used.

Communication Between Units

All types of elements in the Bendix Data Processing system attach to common communication lines. Each magnetic tape unit can search for a specified block of information independently of any other operations on the line. Operation of the card reader, or the card punch, and the control console can both be concurrent with a magnetic tape read-write operation or with internal computation. The system may be expanded by adding additional elements to the communication line.

Different types of system elements and the manner in which they tie to a communication line are available.

A line can be any desired length up to one thousand feet and can handle information at whatever rate the units attached to it operate. As many as 70 units of any types desired can connect to a single communication line.

Information can pass from one element on a communication line to another without passing through the central processor. Any input device attached to the line can send information to either the memory of the central processor or to a control buffer on the line. Any output device attached to the line can receive information from the memory of the central processor or from a control buffer.

Multiple pairs of input-output elements can communicate concurrently. Input-output elements communicate with each other under control of a central processor or a control buffer. Additional pairs of input-output elements can communicate with each other at the same time by adding control buffers to the system.

A single communication line handles a number of messages at the same time by automatically multiplexing the messages. Additional communication lines are added when

necessary via the control buffers. Two communication lines can be attached to a control buffer. The control buffer can receive information from an element on one line and send it to an element on another line.

Either an on-line or an off-line processing system can be made from the same elements. The user can establish whichever type of system suits his needs and can change from one type to the other when he desires. The same elements can be connected in a system in which input-output can be effectively off-line, or on-line, the selection being made under program control.

Multiple input operation to, and output operations from, directly addressable internal memory can occur concurrently. The central processor may be accompanied by one to seven additional memory modules of 4096 words each. Up to five of the additional modules may be of a type called a memory communication module. An additional independent communication line may be directly connected to, and be controlled by, a memory communication module.

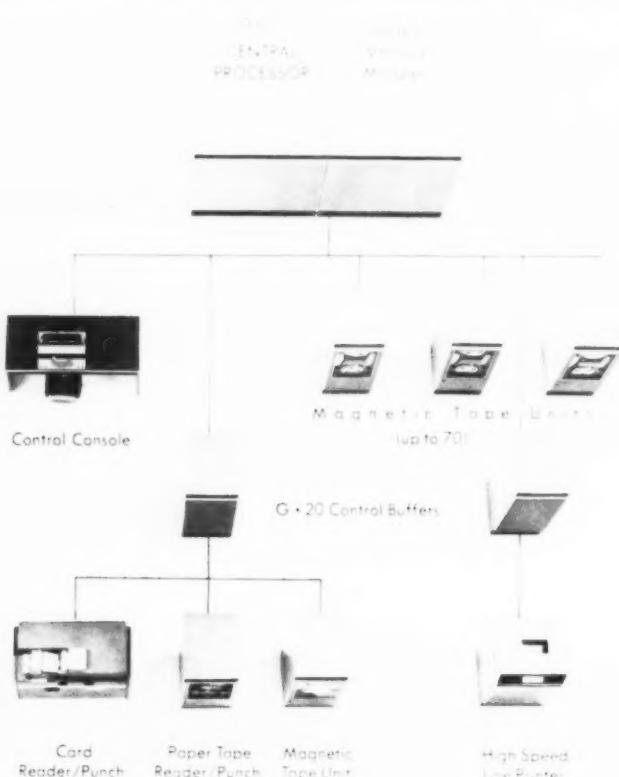
For example, if two communication modules are included in a system, not only is the internal directly-addressable memory increased by 8,192 words, but three communication lines, each with access to a different internal memory module, may be operative simultaneously.

Description of Accessory Units CC-10 Control Console

The control console includes an alphanumeric input-output typewriter which is used for control and monitoring operations. All characters on the keyboard, both upper case and lower case, alphabetic, numeric, and algebraic, can be entered via the keyboard. Type-out is at the rate of approximately ten characters per second.

MM-10 Additional Memory Module

An additional core memory module is similar in size and characteristics to the G-20 internal memory. From one to seven additional memory modules may be attached to the central processor. The modules extend the directly addressable memory to 32,768 words in increments of 4096 each. In programming, auxiliary



memory is indistinguishable from the internal 4096 words.

MC-10 Memory Communication Module

The MC-10 consists of an MM-10 memory module with facilities from direct connection to, and control of, a separate communication line. The MC-10 can control transmission of information between two other units on its communication line. It can be loaded from any input device connected to the communication line and can send information to any output device connected to the line. The MC-10 thus permits multiple concurrent inputs to, and outputs from, directly addressable memory.

MT-10 Magnetic Tape Unit

This is a self-contained magnetic tape unit that attaches directly to a communication line; no additional equipment is required for its operation. Eight information channels and a validity-checking channel are provided on standard Mylar-based magnetic tape. One reel of tape can hold over two million words of information.

Information may be recorded in blocks of arbitrary length. Tape can be erased and updated in blocks. The minimum block length is eighty characters. Information written on tape is checked for validity by special reading heads immediately after recording. Tape can be independently searched for blocks of information in either the forward or reverse direction.

Under control of a standard service routine, information is recorded in blocks of 512 eight-bit characters each. When magnetic tape is used for temporarily storing information from the central processor, an eight-bit character may be equivalent to two decimal digits. Blocks of information on magnetic tape units attached to the central processor's communication line may be directly addressed. The tape unit specifications are:

Read-Write 60,000 eight-bit
Speed characters per second
Search Speed 90,000 eight-bit
characters per second
Re-wind Speed 90,000 eight-bit
characters per second
Start and
Stop Time 4 milliseconds

Change Tape

Time about 1/2 minute
Tape Length 3,600 feet

Note that when a character indicates two decimal digits, the read-write speed is 120,000 digits per second, and the search speed is 180,000 digits per second.

CP-10 Card and Printer Coupler

The CP-10 can couple a communication line to three card-handling and high-speed printing devices. Speed of operation is that of the input-output devices.

The high-speed line printer is Bendix Accessory LP-10. The other input-output units may be conventional IBM card readers and punches. Cards may be read at rates up to 800 cards per minute and punched at rates up to 250 cards per minute.

CP-11 Card and Printer Coupler

The CP-11 permits the coupling of Line Printer LP-11, in place of the LP-10, to a communication line. In its other characteristics, Accessory CP-11 is similar to Accessory CP-10.

LP-10 High Speed Line Printer

The LP-10 line printer operates at 600 lines per minute with a 64-character alphabet. It prints up to 72 characters per line at a spacing of six lines per inch vertically and ten characters per inch horizontally, equivalent to pica type. Vertical format control is provided by a loop of punched paper tape. The LP-10 connects to a communication line via the CP-10 coupler.

Other types of printers can be provided. One with a limited alphabet of 46 characters can print numerical data at 1,200 lines per minute and alphabetic data at 600 lines per minute.

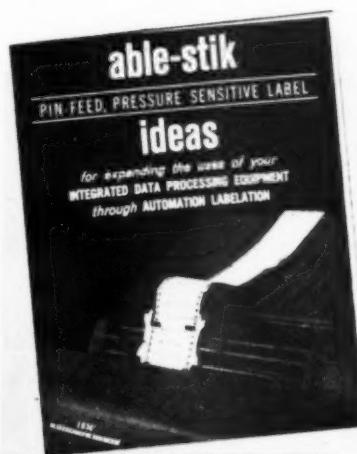
CB-10 Control Buffer

The CB-10 provides data editing, code translating, and input-output control facilities independently of the central processor. By use of a control buffer, information may be sent from one element to another and may be modified during transit, if desired.

(continued on next page)

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without passing through the central processor.

The buffer contains 1024 characters of magnetic core storage and facilities to control the flow of information along either of two communication lines. It can switch from control of one line to control of the other by a programmed command. Since it can receive information from one line, and can send information to the other, the unit permits information from an input device on one communication line to send information to an output device on a separate communication line.

Information is transmitted between the control buffer and the central processor at a rate of 143,000 eight-bit characters per second, a rate much higher than that at which input-output devices operate. The use of control buffers as intermediaries between the computer and input-output devices permits a number of input-output operations to be handled concurrently.

PT-10 Paper Tape Station

This consists of a photo-electric paper tape reader and a tape punch. The reader reads eight-channel tape at the rate of 500 characters per second; it can be stopped on a single character. The punch punches eight-channel tape at the rate of 100 characters per second.

Prices

A G-20 System may be leased for \$15,000 per month, or purchased for \$500,000. First deliveries of the System will be in early 1961. Also, about 300 of the G-15 systems have been delivered so far.

Circle No. 33 on Reader Service Card.

MONROBOT MARK XI

A new electronic computer so sharply reduced in cost that it may reverse the trend toward centralized data processing was announced by Monroe Calculating Machine Co., a division of Litton Industries.

The price of the computer, \$24,500, should make it possible for the smaller businessman to enjoy economies previously limited to larger corporations, and make it possible for larger corporations to process data in branch offices.

As a result of advanced techniques for simplifying arithmetic and logi-



cal circuits, the computer requires less space than an office desk and weighs only 300 pounds. It is fully transistorized and operates from any AC wall outlet, using half as much power as an ordinary electric toaster. It requires no air conditioning.

Because Monrobot Mark XI processes both alphabetical and numerical information, and because it performs logical operations as well as arithmetic operations, it can do the same type of work as machines priced in the \$100,000 to \$1,000,000 category.

Input Output

Information can be fed into the computer from punched tape, punched cards, electric typewriter, teletypewriter or number keyboard. Output may be to tape, cards, typewriter or teletypewriter. The computer will be marketed with a tape reader for input, tape punch for output and typewriter for both input and output. Additional units can be

added in any combination, with three independent input devices and three independent output devices operating simultaneously.

Most operations will be fully automatic because of stored programming. The machine memory, or storage, is contained on a magnetic drum, divided into 1,024 storage registers. Each register can contain one number or word, or two program instructions. The magnetic drum revolves at the rate of 5,200 times per minute, and data flows to and from the drum in the form of electronic impulses at the rate of 160,000 per second.

The Monrobot Mark XI averages about 5,000 arithmetical computations per minute. In a payroll application, one machine can automatically compute the earnings and print the paychecks of 800 people in one eight-hour workday.

Circle No. 31 on Reader Service Card.

■ ■ ■

Notable Quotes

"Just about every project which our operations research group has been asked to handle has brought us into close contact with accounting and financial operations." Franz Edelman, "Accounting and Operations Research—Example of a Problem in Marketing Channels", N.A.A. Bulletin, February 1960.

"More efficiency could be achieved within your organization if the vital paper work or business form were given a higher priority rating than now exists in many companies." Ross M. Allward, "While Decisions Are

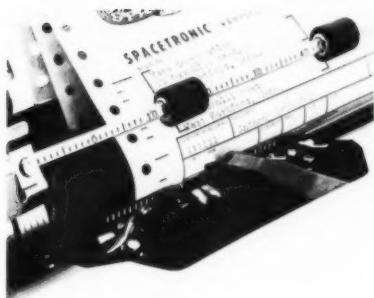
in the Making", Office Administration, January 1960.

"Technique without belief is like a car without wheels or a company without leaders." Laurence E. Sandler, "A Philosophy for Managers", Office Executive, February 1960.

"Gone now is much of the caution that gripped companies during the recession; in its place, a vital confidence in management's ability to streamline operations, solve problems, grow." "Automation in the Office", Office Management, Yearbook issue, January 1960.

■ ■ ■

PRODUCT'S & SERVICES



SPACETRONIC TYPEWRITER

This new electric typewriter, produced by the Royal McBee Corporation, provides automatic horizontal and vertical tabulating control in the preparation of forms and other documents. The new machine employs a photoelectronic sensing device, which can respond to ordinary printed lines on a form, providing automatic format control without the necessity of any programming. No special ink is required in printing the forms.

The machine eliminates any necessity of setting or resetting of tab stops, and can be used readily on a variety of forms with no additional adjustment, since the electronic eye automatically senses the format of the new form and makes the correct stops. The Spacetronic will permit flexibility in design of forms, because no provision will have to be made in preparing the form to reduce the number of tabulator settings required by the typist.

Circle No. 40 on Reader Service Card.

FINANCIAL CENTER

Los Angeles will get the first financial center in the country to process accounting for banks on a contractual basis using magnetic ink character sensing equipment, it was announced by the Service Bureau Corporation, a subsidiary of IBM. Installation will be this fall. SBC reports it is currently providing contractual bank automation for demand deposit accounting for nine banks across the country.

How the System Works

All transactions (checks and deposits) received in the bank during the day are balanced and proved on

an adding machine. Hooked into the adding machine a card punch at the same time automatically creates computer input cards used by the service bureau. The same night, the input cards are delivered to SBC, which functions as the bookkeeping department of the bank. There, electronic computers:

1. Produce a daily trial balance for all accounts.
2. Analyze each transaction for overdrafts.
3. Analyze each transaction for stop payments.
4. Verify accuracy of the account number.
5. Compute average daily float.
6. Compute average daily balances.
7. Assign and control deposits to uncollected funds.
8. Compute service charges.
9. Produce a closed account report.
10. Produce and address a statement for each account monthly.

SBC notes that its electronic demand deposit accounting is available in 16 cities and magnetic ink character sensing equipment services will be offered to banks in all 16 cities as soon as it becomes available.

Circle No. 41 on Reader Service Card.

"300" SERIES

The "300 SERIES", a BULL data processing system, takes its name from the fact that all the units are designed to work at 300 cards or cycles per minute.

Each of the units performs a single operation: they are grouped around a central unit without losing any of their operational independence. This central unit, the Programme Control Unit, directs and coordinates their activities. Synchronization and phasing are electric. In effect there are no mechanical links between the different units. A variety of machine-groupings are possible.

Basic Machines

Programme control unit — reads, calculates, punches at 300 lines per minute. Card sensing and punching unit — reads, punches at 300 cards per minute. Arithmetic unit — reads, calculates, punches. Prints at 300 lines per minute. Collates, reproduces at 300 cards per minute (an additional calculator can be added if required). Printer — "the Universal" data processing system reads, collates, punches, calculates and prints at a speed of 600 cycles per minute.

The "300 Series" data processing system is designed to meet all requirements:

Important problems are tackled by the system as a whole. This complete integration reduces processing steps to a minimum. Smaller problems are tackled by the system as a whole or by a combination of fewer machines selected without disconnecting the remainder.

Circle No. 42 on Reader Service Card.

(continued on next page)





MODEL 910 COMPUTER

Automation of billing operation and other office activities is provided by this new electro-mechanical computing typewriter introduced by Royal McBee Corporation. The new equipment automatically types extensions, sub-totals, and totals. A stored program control makes it possible to print description of taxes, discounts and rates, and associated calculations without recourse to manual keystrokes.

Instructions for the machine can be called into action in a predetermined sequence. Program control for the 910 Computer is obtained through the use of an easily replaceable plugboard, which permits change of instructions from one job to another in a matter of minutes.

The 910 Computer links a Royal electric typewriter to a computing unit through an encoding-decoding component. The computer, housed in a console by the typewriter, contains four accumulating registers of ten digits capacity each, one multiplier register, and one in-out buffer register. The machine, which is powered by standard 115 volt, 60 cycle AC current, will sell for \$6,500, and will also be available for lease.

Circle No. 43 on Reader Service Card.

GENERAL MILLS 2003 COMPUTER

General Mills has developed a transistorized digital computer. The new computer, designated the Model 2003, was displayed at the recent IRE (Institute of Radio Engineers) Show in New York City.

General Mills' 2003 Computer is a solid state, parallel machine with a number of special features. It is designed to fill the need for equipment capable of performing sophisticated

computations with high reliability at a very moderate cost.

The Mechanical Division of General Mills is no newcomer to the computer field. During more than a decade, the division has been developing and manufacturing highly complex computers for military systems. Today, General Mills computers are being used in missile guidance, fire control, bombing and navigation, and in automatic surveying system.

Design features of the new computer include 64 plug-in instruction cards, each of which contains a programmed order (additional instructions can be added by simply putting in one more circuit card per instruction); two 64-word magnetic core buffer systems that permit the computer to accept and exchange information while computations proceed uninterrupted; the ability to transfer a 64-word block (64 orders or numbers) of input, output or internal information by means of a single instruction; very low power requirements; no necessity for air conditioning when surrounding temperatures are between 25° and 125°F.

In computer language, the General Mills device is a 36 bit +, parallel, stored programmed machine. It is designed with one 4096-word core memory. The console has simplified control. Several peripheral equipment items, including an extremely fast magnetic tape memory system, are available also. A basic system costs about \$200,000 and leasing arrangements can be obtained.

Circle No. 44 on Reader Service Card.

CONSECUTIVE CHECK NUMBERS

Consecutive numbers in magnetic ink are now available in connection with the check printing services of Autographic Business Forms, Inc., South Hackensack, N. J. Using the E-13B "common language" type font, the checks to which Autographic will apply an individual check number may be continuous, or of unit set construction. The use of serial numbering will make it possible for banks to sort the checks of large depositors into consecutive order as part of their balancing and account reconciliation functions.

Circle No. 45 on Reader Service Card.

ELECTRONIC TIMER

The Sloan Company's Auto-Timer Division of Sun Valley, California, is

now manufacturing a new, subminiature Electronic Timer capable of handling 25 amps, 32 volts inductive over an ambient temperature range of -55°C to +125°C. Designed primarily for applications where multiple pulsing can be used to trigger a number of programmed functions, Model 303 timers are basically High Current Capacity, free-running pulse generators with externally adjustable period and pulse.

Circle No. 46 on Reader Service Card.

GENERAL ELECTRIC TO RECEIVE FIRST RPC-4000

The RPC-4000, introduced in November 1959, by Royal Precision Corporation, is a fully transistorized general purpose digital electronic computer system which can serve both scientific and business data processing needs. General Electric will place the first RPC-4000 in operation in its marketing services division as a part of a special program of basic research in marketing.

The RPC-4000 will be available at a monthly rental of \$1,750, or a total sale price of \$87,500, with first deliveries scheduled for July. No site preparation or installation costs are necessary. The RPC-4000 has a magnetic drum memory capacity of 8,008 words.

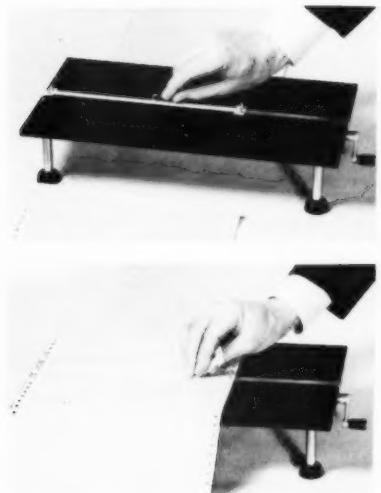
As many as 17 input-output devices may be connected on-line with the basic system. Standard input-output equipment for the RPC-4000 is a tape-typewriter system, complete with typewriter, desk and tape punch-read console, all specially designed as a unit.

Basic reader speed is 60 characters per second; basic punch speed is 30 characters per second. A reversible photo electric reader which reads punched-paper tape at 500 characters per second and a high speed punch—300 characters per second—are available as optional accessories for system expansion. Peripheral equipment to be made available in 1961 includes a magnetic tape drum and a line printer. The weight of the basic system is under 1,000 pounds.

Circle No. 47 on Reader Service Card.

THE JOINER

This Tedlar Co. splicer joins continuous strips of data processing forms using pressure sensitive tapes. Tapes are perforated down the middle so that sets can be separated



after processing. The four pins at the left are in fixed positions. Turning the handle controls the position of the two pins at the right. This permits precise adjustment to any width form and accurate compensation for stretch or shrink of paper.

Illustration No. 1 (top) shows tape being positioned, adhesive side up. The form strips are then aligned on the pins so that they meet at the center, bottom sides adhering to the tape. Illustration No. 2 shows tape being applied on the top, completing the splice. Price: \$69.00.

Circle No. 48 on Reader Service Card.

MODEL 160

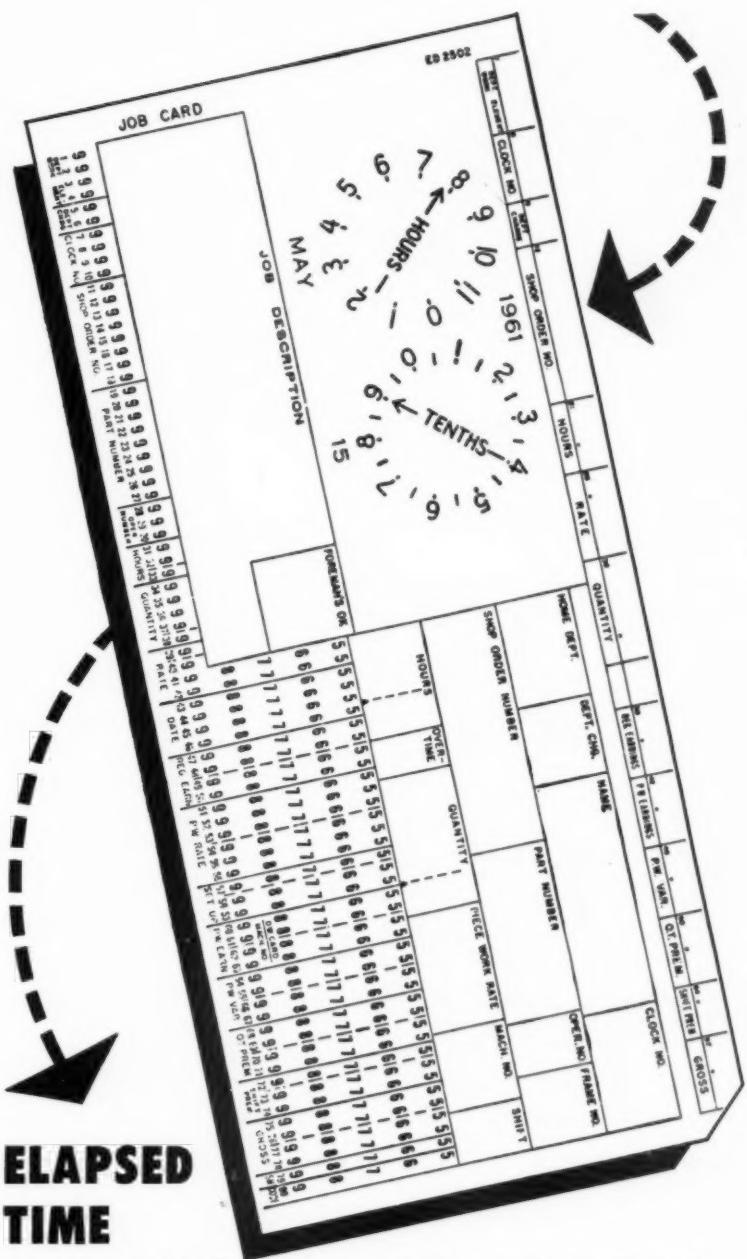
Control Data Corporation announced the desk-size Model 160, all-transistorized electronic computer. The 160 has been designed to combine versatility and speed.

The 160 Computer has an array of building blocks and a magnetic core memory similar to those used in the Control Data 1604. The 160 computes in microseconds, and can execute 60,000 instructions in one second. It handles data transmissions to and from input-output equipment at speeds of up to 65,000 characters per second.

It is a single-address computer with high-speed parallel mode of operation. Storage cycle time is 6.4 microseconds. Basic add time is 12.8 microseconds. Information read is available 2.2 microseconds after start of cycle. Average execution time is 15 microseconds per instruction.

It has a repertoire of 62 instructions and a complete programming

(continued on next page)



ELAPSED TIME

*automatically computed and printed
on any job or tab card*

If manual computation of elapsed time is time-consuming and error-producing, the automatic, foolproof Calculagraph can eliminate this weak link in your cost system. The time-tested Calculagraph, now available to industrial users, will do the job for you accurately, regardless of the card system you now use — it's that flexible. Write to us now and enclose samples of your job tickets.

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INDUSTRIAL DIVISION

CALCULAGRAPH Company

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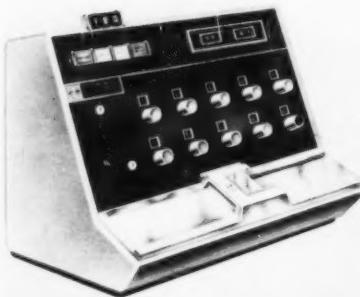


package, which includes fixed point arithmetic, floating point, complex floating point, decimal, floating decimal, and an algebraic compiler.

Input-output devices: 350 character per second paper tape reader, 60 character per second paper tape punch, electric typewriter, up to eight magnetic tape handlers, card reader, card punch, and line printer.

Cost of the computer is \$60,000.

Circle No. 49 on Reader Service Card.



MODEL 180 DATA COLLECTOR

This Control Data device, the size of a typewriter, collects and records the necessary data for use by computers to process such items as payroll, work-in-process inventory, costs and scheduling operations.

The 180 Data Collector assembles into punched paper tape variable data, identification data from pre-punched cards, fixed data and time from an internal clock. The variable data are inserted from 10 manually-operated dials. The identification data are selectively read from punched cards by a card reader also developed by Control Data Corporation. This card reader employs a pneumatic principle. Variable card lengths may be used; bent or wrinkled paper cards and plastic cards can also be read. Output data is recorded at the rate of 15 characters per second on 5, 6, 7 or 8 level punched paper tape. Each 180 Data Col-

lector contains its own output paper tape recorder.

The punched paper tapes collected from a number of Data Collectors located throughout the facility are processed by any standard central computer to generate a variety of management reports. Production units will be ready for delivery starting in the summer of 1960. Price of each Model 180 is \$2,995.

Circle No. 50 on Reader Service Card.

FEATURES OF 1401

Three internal features for the solid state IBM 1401 data processing system were announced by International Business Machines Corporation's Data Processing Division. They are designed to provide greater capacity and flexibility for various configurations of the system and will be available optionally on a plant-installed basis during the last quarter of 1960.

The features are Advanced Programming, Compressed Tape and Punch Feed Read. In addition to these three optional features, it was also announced that two other internal features will be incorporated as standard for increased 1401 flexibility at no additional charge. These are Dual Density Tape and Rewind and Unload.

Optional Features

Advanced Programming. Incorporates indexing, store address register and move record instructions which extend programming logic, simplify total programming effort and reduce processing time. Specifically, Advanced Programming facilitates address modification and routine linkage and loop control, permits easy handling of variable length records, and makes possible the move of entire records or areas. For IBM 1401 MODEL B card system, MODEL C card/tape system and MODEL D tape system. Monthly Rental: \$105. Purchase Price: \$3,935.

Compressed Tape. Provides two new instructions enabling the 1401 to accept and expand a tape record which has been written with high order zero suppression by the IBM 7070 data processing system. Requires prior installation of Advanced Programming feature described above. For IBM 1401 MODEL C card/tape system and MODEL D tape system. Monthly Rental: \$35. Purchase

Price: \$1,300.

Punch Feed Read. This feature provides the 1401 with the ability to punch output information into the same cards read for input. A read station is installed in the punch feed of the 1402 card read-punch to add a second card input. For IBM 1401 MODEL B card system and MODEL C card/tape system. Monthly Rental: \$80. Purchase Price: \$2,985.

Standard Features

Dual Density Tape. Enables, under switch control, IBM 729 magnetic tape units (Model II or IV as specified) to operate with either single or double density tape. For IBM 1401 MODEL C card/tape system and MODEL D tape system.

Rewind and Unload. By additional instruction, makes the magnetic tape rewind and unload operation identical with the same operation on other IBM tape data processing systems. For IBM 1401 MODEL C card/tape system and MODEL D tape system.

Circle No. 51 on Reader Service Card.



UNIVAC PAPER TAPE READER

Punched paper tape, from tape-punching typewriters, wire communications and retail store accounting machines, can now be fed directly into to UNIVAC 60 and 120 calculators, it was announced by the Remington Rand Univac Division of Sperry Rand Corporation.

Known as the Univac Paper Tape Reader, the new unit eliminates the necessity for tape-to-card conversion and permits up to 8,800 characters per minute of data to be fed directly into the calculator.

The Univac 60 and 120 can now accept data from either punched cards or paper tape, or from both at the same time. The final processed

data is punched onto cards.

The reader will rent for \$600 a month or it may be purchased at \$35,120; deliveries to begin in two months.

Circle No. 52 on Reader Service Card.



COLLINS KINEPLEX SYSTEMS

First on-the-site industrial demonstration of a high-speed digital data communications system was successfully completed recently when Collins Radio Company's Western Division, Burbank, Calif., transmitted more than 500,000 punched cards at the rate of 100 per minute over a telephone line for the Chrysler Corporation.

The Chrysler card transmission circuit linked the automaker's general offices in Highland Park, Mich. with the Dodge main plant in Hamtramck, Mich. Purpose of the demonstration was to show application of Collins Kineplex data communications systems in industrial and business data processing. Kineplex systems have been operating between military and government data processing and communications centers for several years.

Collins recently concluded a similar demonstration for the Veterans Administration during which more than 350,000 cards representing actual insurance premium notices were transmitted between St. Paul, Minn. and Philadelphia, Pa. over telephone lines.

During the nine-day demonstration at Chrysler, the Kineplex system operated in full duplex mode, with cards transmitted and received in both directions simultaneously. The

(Continued on next page)



"Here's how I cut costs

and saved hours

in wiring CONTROL PANELS"



1. Wiring control panels for data processing machines used to be a headache—as was changing or checking those tangled wires. Then I read about the new GC panelLOGIC Kit. It was supposed to save me work, time and money, so I ordered one.



2. My panelLOGIC Kit came the same week, with pliers for cutting and stripping wires, two simple tools for wrapping and unwrapping, a supply of terminals, wire, and instructions. Clear step-by-step color photos show how to make neat, compact, tight panels.



3. Complete color-coding by major card field and machine function is simple with panelLOGIC's ten wire colors. Wiring is easy to check and to change. And finished control panels can be stored more compactly.



4. The beauty of panelLOGIC lies in its simplicity. Why didn't someone think of this before! Why don't you write and get the full story?

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TODAY
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This new full-color booklet shows the complete panelLOGIC Kit with its simple tools—explains how to use it. For your FREE copy, send this coupon today!

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Please rush my free copy of the GC panelLOGIC brochure titled: "Introducing an all-new approach to Control Panel Wiring".

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Company Name _____

Street _____

City _____ Zone _____ State _____

Collins system transmits 100 cards per minute in each direction. Binary-punched computer program cards as well as payroll accounting and parts inventory control cards were transmitted for Chrysler observers.

In operation, the Collins Kineplex system reads the cards, converts the punched information to audio signals and transmits them over telephone and radio circuits. At the other end of the line receiving equipment converts the signals back to punched card form.

R. L. Ericson, Collins Western Division sales director, pointed out that Kineplex card and tape transmission systems utilize ordinary telephone or radio voice channels. In most cases, he said, no special communications links are required since existing

facilities can be used; transmission distances are virtually unlimited.

Circle No. 53 on Reader Service Card.

MOTORSHLF

Motorshelf is the newest member of the Wheeldex-Simpla family of files "that come to you." The manufacturer states that it offers fully-automatic or semi-automatic operation for standard correspondence or legal size files and for special sizes or materials.

The manufacturer also reports a 40% to 65% saving in filing floor space as well as up to 50% of aisle space. Motorshelf can also eliminate costly partitioning in many places by serving as a room divider. Described

in free Wheeldex & Simpla Products, Inc. booklet, "Shelves That Come to You."

Circle No. 54 on Reader Service Card.



DATA . . . yours for the asking

For your convenience in obtaining pertinent and helpful information on the latest equipment, forms, services and related products in the data processing field, we direct your attention to the following free literature available from the manufacturers. Circle the numbers pertaining to the literature you wish to receive on the Reader Service Card appearing elsewhere in "D.P."

MODEL 110 PHOTOCOPIER is the subject of new product literature from A. B. Dick Company. The six-page folder illustrates, in color, the features of the machine and outlines simple, step-by-step operating procedure.

Circle No. 70 on Reader Service Card.

THE EXPANDING ROLE OF UNIVERSITIES AND COLLEGES in computing and data processing is highlighted by two recent publications available from Burroughs Corporation's ElectroData Division. The November issue of *Data* describes the varied and complex computational work being done on Burroughs computers at Georgia Tech and Georgetown University. Bulletin E-123 lists typical applications at universities which have installed the

Burroughs E101 desk-size computer.

Circle No. 71 on Reader Service Card.

CHECKOUT EQUIPMENTS BROCHURE describes four new Epsco Automatic Checkout Equipments — an RMS-to-DC Converter, a Voltage-to-Digital Converter, a Timer-Counter and a Digital Printer. These militarized units are in use today in a missile automatic check-out system that measures DC voltages, AC voltages, and the transient responses of servos which control time, frequency, ratio, thrust, roll, pitch and yaw.

Circle No. 72 on Reader Service Card.

GE 210 is described in a 12-page, color brochure of General Electric Company's Computer Department, Phoenix, Ariz. The GE 210 employs magnetic character recognition, a building-block design for easy expansion, and complete transistorization. The new system is capable of handling data-processing requirements in such areas as banking, utility billing, government and others.

Circle No. 73 on Reader Service Card.

SERIES 2010 LOGIX BLOCKS are a complete and compatible set of transistorized, digital logic circuit plug-in cards for rapid, low cost

"building block" design and construction of special purpose digital computers and processing equipment. This Rese Engineering, Inc. technical bulletin shows block diagrams, descriptions, specifications and suggested applications for each of the eight plug-ins, as well as the Model 2010-SU Power Supply, Model 2010-CG Mounting Cage and Type 2010-LO Wiring Layout Sheets.

Circle No. 74 on Reader Service Card.

KEYSORT DUPLI PUNCH style sheet released by Royal McBee Corporation of Port Chester, N. Y. is illustrated with sequence operational photos. The Dupli Punch is described as a portable, economical point-of-activity device for reproducing fixed punched data from a master Keycard to Keysort cards or sets. The Dupli Punch is non-electrical, requiring no maintenance service.

Circle No. 75 on Reader Service Card.

TELETYPE 28 STUNT BOX is a 20-page full color brochure with primary purpose of providing users and potential users of Teletype Model 28 equipment with an understanding of how the page printers and automatic send-receive sets can be utilized to maximum capabilities. A basic explanation of the equipment, its operation and application is given. All technical explanations are color-keyed for easy comprehension.

Circle No. 76 on Reader Service Card.



PEOPLE AND PLACES

BFI NEW PRESIDENT

LESTER J. JOHNSEN has been elected president of the Business Forms Institute, trade association of the manifold business forms industry, by its board of directors at the Institute's annual meeting in New York City. Mr. Johnsen, who is executive vice president of the Atlantic Register Company, Waltham, Mass., has long been active in the BFI.

CORPORATE DIRECTOR

JOHN L. ROSE has been appointed corporate director of public relations for Burroughs Corporation. He had been associate director since 1955. Mr. Rose is a former staff correspondent for both the Associated Press and the United Press. Active in professional circles, he was owner-publisher of the Pismo Times, Pismo Beach, Calif., before joining Burroughs in 1953 as manager of communications and publicity.

BURROUGHS EXECUTIVES

Two Burroughs Corporation executives have been appointed assistant vice presidents. They will serve as general managers of groups within the newly created Equipment and Systems Marketing Division. R. O. BAILY, has been named assistant vice president and general manager of the General Products and Systems Group, and E. S. McCOLLISTER, assistant vice president and general manager of the Data Processing Systems Group.

NEW MAN AT BALTIMORE BUSINESS FORMS

ROBERT McCOURT, formerly district sales manager of The Standard Register Company, has been appointed assistant to the general sales manager of The Baltimore Business Forms Company. McCourt will work from the company's New York office. His initial assignment is to work on new developments with major oil companies through Baltimore Business Forms' representatives who service those accounts.

C-E-I-R DIRECTOR

J. PAUL WALSH, formerly Deputy Director of Project Vanguard,

and Systems Manager for Special Products at IBM's Federal Systems Division, has joined C-E-I-R, Inc. as Director of the Space and Weapons Systems Division.

Dr. Walsh organized and managed the Vanguard operations at Cape Canaveral, and directed the operation that launched the first Vanguard satellite into orbit.

PROGRAMMING COORDINATOR

DR. DAVID SAYRE has been appointed manager of programming

planning for International Business Machines Corp. He will report to the IBM director of research, and will be responsible for the coordination of programming activities throughout the company. Dr. Sayre, an alumnus of Yale University and Alabama Polytechnic Institute, received a Ph.D. degree from Oxford University. He began his IBM career in 1955, joining the programming research department the following year, and engaging most recently in artificial intelligence research. ■

New

TRACT-A-FILE Jr.

Conquers

FILING SPACE PROBLEMS

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MANUALS & WRITE-UPS
 - TELEPHONE DIRECTORIES
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Reference data always at hand.



• Highly adaptable TRACT-A-FILE JR. stacks anywhere 2-to-5 high. Only domestic shelving unit with "home" (hanging-type) folders and moveable followers to provide for all-purpose filing. Dimensions—Outer: 20" wide, 14 $\frac{1}{4}$ " high, 12 $\frac{3}{4}$ " deep. Inner: 18 $\frac{1}{2}$ x 12 $\frac{1}{2}$ x 12 $\frac{1}{4}$.

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BOOK SHELF

COMPUTERS AND PEOPLE — Business Activity in the New World of Data Processing by J. A. Postley, McGraw-Hill Book Company, Inc., 327 W. 41st St., New York 1, N. Y., 1960, 251 pages, \$6.00.

What modern computers can mean to readers for whom these machines are designed to serve — such as executives, department managers, and other non-technical people — is explained in this book which gives a realistic picture of electronic devices that can lead to fresh techniques of business operation and control. Mr. Postley provides a clear discussion of the economics of computers and explains equipment in terms that can readily be grasped by non-specialists. He describes compromises that the data processing specialist must make in behalf of the organization he serves as well as the decision-making aspects of computers and changes that must be made by business to utilize data processing most effectively.

Future equipment and computer capabilities are predicted, and the role that computer manufacturers should play in maximizing benefits to users is also treated. The book discusses the personnel problems created by modern data processing equipment and includes an illustrative review of some present and forthcoming applications of computers.

THE EFFECT OF AUTOMATION ON ACCOUNTING JOBS by M. L. Edwards, Doctoral Dissertation, University of Oklahoma, University of Oklahoma Press, Norman, Okla., 1959.

Personal traits, work habits, and job preparation required by workers in the automatic data processing field are very similar to those required in other office workers. However, those having responsibilities in education for business, at both the secondary school and collegiate levels, should begin immediately to resolve the vocational education problems resulting from changes in the methods routine clerical work can be accomplished.

Data was derived from an extensive survey of current literature and case-study reports, based on interviews with 42 data processing supervisors, relative to the circumstances surrounding the utilization of punched card equipment.

This study might be used by business educators as a look into the overall operations of data processing units; to provide a better understanding of the implications of automation for business education and to identify the educational needs in meeting the challenge of automation.

AN INTRODUCTION TO ELECTRONIC DATA PROCESSING by R. Nett and S. A. Hetzler, The Free Press, 119 W. Lake St., Chicago 1, Ill., 1960, \$6.75.

This volume has been prepared for those who will have to decide whether or not to adopt computers to their research organization, business, or government agency. The book covers the technology, the techniques, the economy, and the personnel problems of computer research. The authors have been able to encompass in clear fashion a wealth of material because they have avoided discussing details which are of interest only to mathematicians and computer engineers. A valuable section of the book describes available computer equipment.

This book to some extent is based on the experience acquired by the authors working in the Electronic Data Processing Training Program for the Air Force's Air Materiel Command. This program was organized and directed by Dr. Hetzler aided by Dr. Nett, where they observed the problems attendant to the largest electronic data processing enterprise in existence. As a result it lacks understanding of the medium size business data processing problem. ■

OUTPUTS

ITEMS OF INTEREST
FROM HERE AND THERE

RECOMP PROGRAMMING TECHNIQUE

A linear programming technique normally available only to users of large digital computers can now be accomplished on the Recomp general purpose digital computer. It was first demonstrated on the computer at the third Recomp Users Conference held in New York City. The technique can be applied to gasoline blending where the best possible combination of ingredients can be determined consistent with requirements and yield the highest profit to the producer. Linear programming can also be used in solving such industrial problems as materials scheduling, and transportation and maximum use of warehouse space. In addition to linear programming demonstrations, Recomp users were told of an assembly method called SNAP. This small, general purpose transistorized digital computer is produced and marketed by the Industrial Products organization of Autonetics, a division of North American Aviation, Inc.

NEW OFFICE FOR CONTROL DATA

Mr. Frank C. Mullaney, Vice President of Control Data Corporation and General Manager of its Computer Division, announced the opening of a sales and applications office in the San Francisco Bay area, to be managed by Dale L. Wilson. In addition to the sales and customer liaison activities, an applications staff has been established to handle computer programming efforts.

CUSTOMER SERVICE

The Computer Department of the General Electric Co. is offering new prices for IBM 704 Data Processing machine time, for program development, debugging and production, including use of card-to-tape and tape-to-printer, on first and second shift. Customers can bring 704 programs to the machine at Tempe, Arizona, and run them themselves or can mail them to G. E. and their operators will run them and mail back the results.



MINIATURE "DETROIT"

A miniature assembly line is turning out computer transistors at the rate of 1,800 an hour. International Business Machines Corp. said that its engineers have developed a transistor assembly system for making the devices that have become essential to the manufacture of data processing equipment. Designed and engineered at IBM's Poughkeepsie plant, the machine has just completed its first test-month of production.

The IBM machine is roughly five times faster than the semi-automated assembly of transistors now in use. The 500-sq.-ft. machine has nine units, joined by conveyors. It assembles six transistor parts, some of which are so small that 20 will fit easily into the eye of a housewife's needle.

HIGH SPEED PRINTER SALES

The sale of two Stromberg-Carlson S-C 5000 High-Speed Electronic Printers to System Development Corporation has been announced by William G. Alexander, General Manager of Stromberg-Carlson — San Diego. Stromberg-Carlson is a division of General Dynamics Corporation. SDC, an independent, non-profit organization, has its headquarters in Santa Monica, Calif.

Delivery of the two, 100,000 word-per-minute printers is expected to be made shortly after the first of the year. SDC, which is engaged in the development of large-scale, man-machine control systems, will use the printers to print out information from its 709 and SAGE computers.

CLASSIFIED

Employment Opportunities

DATA PROCESSING AND COMMUNICATIONS

Are you a Professional with Administrative Potential who is looking for broader horizons — more responsibility, recognition and compensation? If so, send a copy of your résumé, details of your ability and the section of the country in which you would like to work.

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CONSULTANT ON AUTOMATION AND
COMMUNICATIONS
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Used Equipment

FOR SALE

USED VERTICAL TUB FILES

Contact John Maceda, Long Island Drug Co.,
105-23 New York Blvd., Jamaica, N. Y.

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Ten Rules for Control and Evaluation of Data Processing Departments

THE OBJECTIVES of controlling and evaluating data processing departments are (1) to distribute costs, (2) to determine equipment and personnel needs, and (3) to get reports out accurately and on time. If the following rules are followed, improvement in data processing efficiency can be expected.

1. Distribute *all* costs, including supervision, forms, equipment rental, etc.
2. Where possible, distribute costs *directly*, such as operator time that can be assigned to a specific job.
3. Determine the *accuracy* of machine time reported. Like any other reports, these must be proven accurate if they are to be relied upon.
4. *Don't* collect data or prepare reports you don't use. Most organizations who keep machine utilization records never make decisions based on these records.
5. *Large* punched card installations need controls more than small ones. In small installations, the need for more or less equipment is usually obvious.
6. Assign staff time to scheduling and time analysis or *don't* expect results. Unless the manager of data processing or his equivalent takes the time to investigate delays, there can be no substantial improvements anticipated.
7. Decide if *continuous* time records are needed. Usually a three month time survey is plenty.
8. *Evaluate* performance against either, a) running time, b) standards, c) estimates. Preferably in this order.
9. Percentage of machine utilization without schedule *doesn't* tell the whole story. An effective system must show both.
10. Keep it *easy* for operators. Otherwise you'll have a morale problem. No one likes to be measured.

Don't let your data processing department be like the shoemaker's son. It's not going to run itself. It has to be controlled. ■

-for free information

on items mentioned in this issue of DATA PROCESSING

Please send information and literature on items circled below.

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21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60
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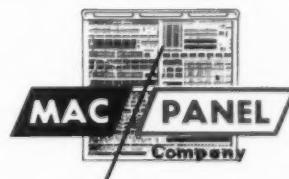
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WE'RE PROUD!

It is a unanimous feeling of pride! Pride of product, sales; but more than that, a profound pride of accomplishment. The control panel industry has been influenced by our realistic prices, by our improved quality and service. This industry is expanding and MAC Panel is respected as a leader. This is the reason for the pride we display. You have made it possible.



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Circle No. 23 on Reader Service Card.

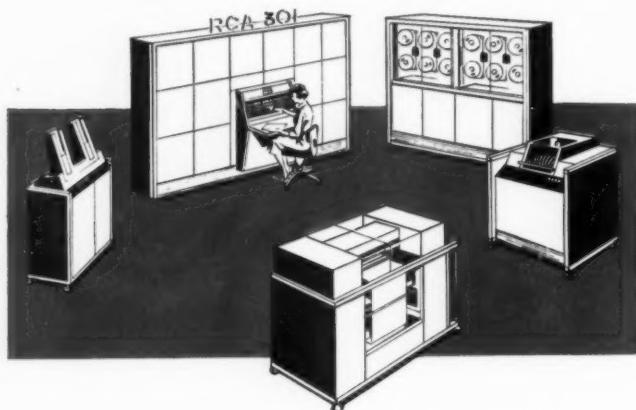
BIG NEWS

in ELECTRONIC DATA PROCESSING

Two new systems, latest in a series of EDP Advancements from RCA
—world leader in electronics—join the established RCA 501

For Business in the Smaller Ranges • Divisional Operations

THE NEW **RCA 301**

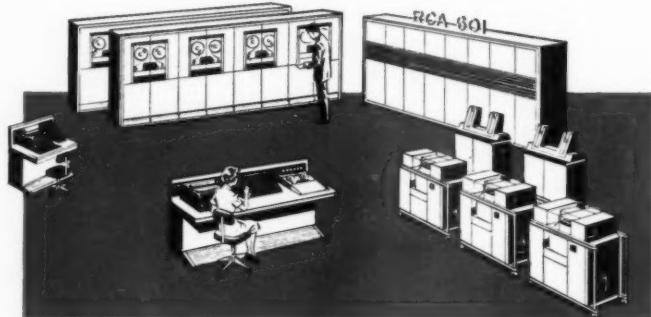


COMPLETE, Compact EDP System at Low Cost... with Optimum WorkPower and Speed

- DATA STORAGE OPTION: magnetic tape or new design discs that switch easily for changing jobs—23 million character capacity
- HIGH VERSATILITY: paper tape, magnetic tape, punch card, or combinations, for input-output
- GREATEST CAPACITY, fastest core memory in price class—20,000 character storage; 7 millions of a second access time; variable word length
- FULL SPEED—reads 600 cards/minute; prints 900 numeric or 600 alpha numeric lines per minute
- AUXILIARY ROLE—feeder or extender to 501 or 601 EDP Systems
- SIMULTANEITY OPTION permits large increase in workpower

For Large Business or Scientific Operations

THE NEW **RCA 601**



TREMENDOUS WorkPower . . . in Every Field of Data Processing . . . with Previously Unattainable CAPACITY—EXPANSIBILITY—ECONOMY

- ULTRA-FAST—to 180,000 digits/second with magnetic tape
- EXCEPTIONAL COMPUTING SPEED, 1.5 millionths of a second "add" time, 1.5 millionths of a second memory access time
- PARALLEL PROCESSING permits handling a multiplicity of independent programs with changeable priority
- UNPRECEDENTED COMPATIBILITY—with RCA data processing and communications equipment and other processors
- OMNI-CHANNEL INPUT/OUTPUT permits transfer of information to and from as many as 64 sources, with concurrent computing

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For information about the complete transistorized line, write: Electronic Data Processing Division, Radio Corporation of America, Camden 2, New Jersey.



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RADIO CORPORATION OF AMERICA